HITACHI

SERVICE MANUAL

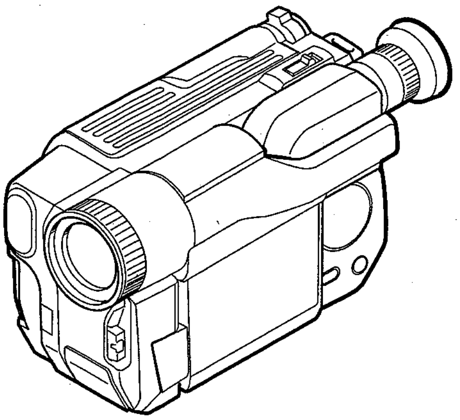
V25580

TK | No.7001E

VM-H768LE(AU)/H768LE(SW)
VM-H765LE/H765LE(UK)
VM-H665LE/H660E
VM-E568LE(AU)/E568LE(SW)
VM-E565LE/E563LE(UK)
VM-E368E(AU), E368E(SW)
VM-E360E/E360E(UK)

AC Adapter
VM-ACE5E/ACE5E(AU)/ACE5E(UK)

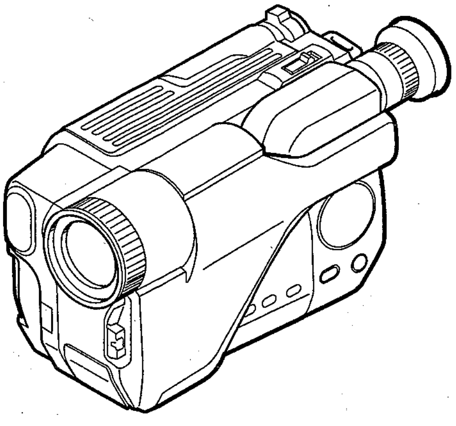
UH MECHANISM



VM-H768LE(AU)/H768LE(SW)/H765LE/
H765LE(UK)/H665LE/E568LE(AU)/
E568LE(SW)/E565LE/E563LE(UK)

■ When Servicing the Mechanism:
This camera/recorder uses a UH mechanism. When servicing the UH mechanism, refer to the following service manuals:

Item	Manuals to be referred to
Disassembly	UH Mechanism (No. 6811E)
Mechanical Adjustment	UH Mechanism Supplement (No. 6811E-1)
Maintenance/ Inspection Procedure	UH Mechanism (No. 6811E)
Exploded View	Chapter 4 in this manual



VM-H660E/E368E(AU)/E368E(SW)/
E360E/E360E(UK)

8

Hi8

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

8mm VIDEO CAMERA/RECORDER

January 2000 Digital Media Products Division,Tokai

COMPARISON OF FEATURES

Note: Destinations normally added at the end of model names, (AU), (SW), (UK), etc. are omitted in this table.

ITEM		VM-H755LE/E558LE VM-E555LE/E553LE	VM-H768LE/H765LE VM-H665LE/E568LE VM-E565LE/E563LE	VM-H660E/E368E/E360E
GENERAL	Power Requirements	7.2V DC		
	Power Consumption (when recording/ LCD monitor ON)	4.6W [VM-E755LE] 4.3W [VM-E558LE/E555LE/E553LE]	4.1W [VM-H768LE/H765LE] 4.0W [VM-H665LE] 3.8W [VM-W568LE/E565LE/E563LE]	3.5W [VM-H660E] 3.4W [VM-E368E/E360E]
	Dimensions (W mm × H mm × D mm)	118.5 × 102.5 × 181	111.5 × 111.5 × 202	
	Weight	Approx. 850g	Approx. 836g	Approx. 757g
VIDEO	Format	8 mm (Hi-8) [VM-H755LE] 8 mm [VM-E558LE/E555LE/E553LE]	8 mm (Hi-8) [VM-H768LE/H765LE/H665LE] 8 mm [VM-E568LE/E565LE/E563LE]	8 mm (Hi-8) [VM-H660E] 8 mm [VM-E368E/E360E]
	Record/Playback System	Two video record/playback heads		
	Video Signal	PAL colour & CCIR monochrome signal 625 line		
	Tape Speed	SP: 20.05mm/s		
	F.F/Rew Time	Less than 6 minutes with P5-90 cassette		
	Head Weel	40 mm		
	Basic Chassis Type	UH		
CAMERA	Scanning	625 lines/50 fields/25 frame		
	Required Minimum Illumination	0.5 lx [VM-H755LE] 0.1 lx [VM-E558LE] 0.3 lx [VM-E555LE/E553LE]	0.5 lx [VM-H765LE/H665LE] 0.3 lx [VM-H768LE/E568LE/E565LE/E563LE]	0.5 lx [VM-H660E] 0.3 lx [VM-E368E/E360E]
	Camera Device	1/4 inch C.C.D		
	Lens Diameter	46 mm		
	Zoom Ratio	22 : 1 (4.0 - 88.0mm)		
	Aperture	F1.6 - 3.8		
	Zoom Speed	Adjustable speed		
FEATURES	Electronic Viewfinder (EVF)	CRT (Black & White)		
	Electrical Zoom Function	Yes [× 400 (22 × 12 × INST. ZOOM)]	Yes [× 500 (22 × 22)]	
	INST. ZOOM Function	Yes (× 1.5)	No	
	Autofocus System	Video AF System		
	Program AE (Shutter Speed)	Yes (Program AE only)		
	Selective Program AE	No	Yes [VM-H768LE/H765LE/H665LE/E565LE/E563LE] (AUTO, SPORTS, PORTRAIT, SPOTLIGHT, GAIN UP) No [VM-E568LE]	Yes [VM-H660E] (AUTO, SPORTS, PORTRAIT, SPOTLIGHT, GAIN UP) No [VM-E368E/E360E]
	AV Input Function	No		
	S-Connector Output	Yes [VM-H755LE] No [VM-E558LE/E555LE/E553LE]	Yes [VM-H768LE/H765LE/H665LE] No [VM-E568LE/E565LE/E563LE]	Yes [VM-H660E] No [VM-E368E/E360E]
	AV Dubbing	Yes (Using the remote controller)		
	Audio System & Microphone	Stereo [VM-H755LE] Monaural [VM-E558LE/E555LE/E553LE]	Stereo [VM-H765LE/H665LE] Monaural [VM-H768LE/E568LE/E565LE/E563LE]	Monaural
	Multi Playback (PAL 60 Conversion)	Yes (Selective)		
	Digital Effect & Fade	Yes		
	Date Search	Yes		

	ITEM	VM-H755LE/E558LE VM-E555LE/E553LE	VM-H768LE/H765LE VM-H665LE/E568LE VM-E565LE/E563LE	VM-H660E/E368E/E360E
FEATURES	Tape Analyzer ATRS	No	Yes [VM-H768LE/H765LE H665LE] No [VM-E568LE/E565LE/ E563LE]	Yes [VM-H660E] No [VM-E368E/E360E]
	TAPE+ Function	No	Yes [VM-H768LE/H765LE H665LE] No [VM-E568LE/E565LE/ E563LE]	Yes [VM-H660E] No [VM-E368E/E360E]
	Electronic Image Stabilizer (EIS)	Yes (Picture element system) [VM-H755LE] Yes (Electrical system) [VM-E555LE] No [VM-E558LE/E553LE]	Yes (Picture element system) [VM-H768LE/H765LE/ VM-H665LE/E565LE] No [VM-E568LE/E563LE]	Yes (Picture element system) [VM-H660E] No [VM-E368E/E360E]
	LCD Display	2.5 inch		No
	Internal DC Light	No	Yes [VM-H768LE/H765LE] No [VM-H665LE/E568LE/ E565LE/E563LE]	No
	Internal Battery Charge	No	Yes	
ACCE-SSORY	AC Adapter/Charger	VM-ACE5E		
	Battery Pack	VM-BPL13		
	Remote Controller	VM-RME411A(R)	VM-RME611A [Except for VM-E568LE]	VM-RME611A [Except for VM-E368E]

COMPARISON OF MAIN CONTROL ICs

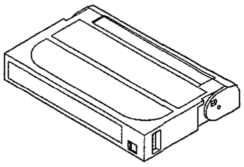
Note: Destinations normally added at the end of model names, (AU), (SW), (UK), etc. are omitted in this table.

	ITEM	VM-H755LE/E558LE VM-E555LE/E553LE	VM-H768LE/H765LE VM-H665LE/E568LE VM-E565LE/E563LE	VM-H660E/E368E/E360E
CCD SENSOR & GYRO	CCD Sensor	ICX211AK-L (IC1001) [VM-H755LE] ICX207AK-K (IC1001) [Except for VM-H755LE]	ICX211AK-L (IC1001) [VM-H765LE/H665LE] ICX207AK-K (IC1001) [VM-H768LE/E568LE/ E565LE/E563LE]	ICX211AK-L (IC1001) [VM-H660E] ICX207AK-K (IC1001) [VM-E368E/E360E]
	V-Move (Vertical Gyro)	ENC-03JA-03 (IC1401) [Except for VM-E558LE/ E553LE]	ENC-03JA-03 (IC1401) [Except for VM-E568LE/ E563LE]	ENC-03JA-03 (IC1401) [Except for VM-E368E/ E360E]
	H-Move (Horizontal Gyro)	ENC-03JB-03 (IC1402) [Except for VM-E558LE/ E553LE]	ENC-03JB-03 (IC1402) [Except for VM-E568LE/ E563LE]	ENC-03JB-03 (IC1402) [Except for VM-E368E/ E360E]
	Gyro Amp	NJM064V (IC1403) [Except for VM-E558LE/ E553LE]	NJU7018M (IC1403) [Except for VM-E568LE/ E563LE]	NJU7018M (IC1403) [Except for VM-E368E/ E360E]
	Sensor Drive (Drive Pulse Generator)	μPD16510GR (IC1103)	μPD16510GR (IC0203)	
VIDEO PROCESS & ATF	Video DSP (Digital Process)	HG73C012TE (IC1102) HG73C061TE(IC0201)	MB87L1551PMT2 (IC0201)	
	ATF	μPC5023GS-122-E1 (IC0601)		
	LCD Process	IR3Y29AM (IC5301)		
	LCD D/A Conv.	M62352GP (IC5302)		
	LCD Pulse Gen.	LZ9GH18 (IC5601)		
	LCD OSC Cont.	NJM3414 AV (IC5602)		
	CDS/AGC & A/D Conv.	HD49323F (IC1101)	HD49323F (IC0202)	
	VideoHead Switch	HA118189MPER (IC0101)	HA118189MPER (IC0101)	

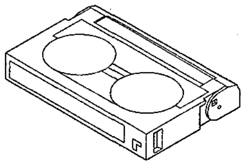
ITEM		VM-H755LE/E558LE VM-E555LE/E553LE	VM-H768LE/H765LE VM-H665LE/E568LE VM-E565LE/E563LE	VM-H660E/E368E/E360E
VIDEO PROCESS	Phase EQ/FM Peak	µPC5023GS-146 (IC0102)	Not provided	
	V. RAM	MSM54V16258A50 (IC0202)		
	Sync Sepa.	BA7071F (IC0203)		
	Video Amp	µPC5023GS-153 (IC0204)	µPC5020GS-129 (IC0301)	
	RGB Amp	Not provided	µPC5020GR-125-8J (IC0350)	Not provided
CAMERA CONTROL & SYSTEM CONTROL	Digital µP (D-µP)	HD6432237M03TE (IC1104)	HD6432237E6H (IC1104)	
	EEPROM	X2509V-217 (IC1105)	AT25160 (IC1105)	
	D/A Conv.	Not provided	MB88347PFV (IC1111)	Not provided
	F Det./Iris Drive	µPC5023GS-147GJG (IC1201)		
	Zoom Motor/Focus Motor Driver	µPD16833AG3 (IC1301)		
	System Control µP (S-µP)	CXP87248A-153R (IC0901)	CXP87360-132R (IC0901)	
	Back-up Det.	NJU7284EV (IC0902)	NJU7285BV (IC0902)	
	Character Gen.	µPD6461GS-942-E1(IC0904) [VM-H755LE/E555LE/ E553LE/] µPD6461GS-941-E1(IC0904) [VM-E558LE]	µPD6461GS-947-E1(IC0904) [VM-H765LE/H665LE/ E565LE/E563LE] µPD6461GS-941-E1(IC0904) [VM-H768LE/E568LE]	µPD6461GS-947-E1(IC0904) [VM-H660E/E360E] µPD6461GS-941-E1(IC0904) [VM-E368E]
	Level Shift	SN74AHC126PW (IC0906)	Not provided	
	IR Receiver	GP1U101X (IC0907)	GP1U101X (IC0701)	
SERVO & POWER	Cylinder Motor Drive	LB1950V (IC0631)		
	Capstan Motor Drive	LB1991V (IC0651)		
	Loading Motor Drive	BA6417F (IC0671)		
	PWM	BA9735KV (IC0551)	BA9736KV (IC0551)	
	5V Reg.	PQ20WZ51 (IC0553)		
	CHG Current Cont.	MM6564XFBE (IC0001)		
AUDIO	Audio Process	HA118193F (IC0401) [VM-H755LE] LA7458W (IC0401) [VM-E558LE/E555LE/ E553LE]	HA118193F (IC0401) [VM-H765LE/ H665LE] LA7458W (IC0401) [VM-H768LE/E568LE/ E565LE/E563LE]	LA7458W (IC0401)
	Speaker Amp	TDA7052AT (IC0402S) [VM-H755LE] Not provided [VM-E558LE/E555LE/ E553LE]	TDA7052AT (IC0461S) [VM-H765LE/H665LE] Not provided [VM-H768LE/E568LE/ E565LE/E563LE]	Not provided
	Audio Matrix	NJM2112V (IC0403S) [VM-H755LE] Not provided [VM-E558LE/E555LE/ E553LE]	NJM2112V (IC0471S) [VM-H765LE/H665LE] Not provided [VM-H768LE/E568LE/ E565LE/E563LE]	Not provided
EVF & LCD	EVF Video Amp/Vertical & Horizontal Deflection	HA118179F (IC2001)	In the EVF unit.	
	LCD SWR.	TL5001CD (IC5401, IC5501)	TL5001CD (IC5501)	Not provided
	LED Cont.	NJM2406F (IC5502)	Not provided	Not provided

JIGS AND TAPES FOR SERVICE

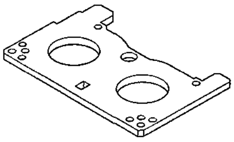
1. **Alignment Tape**
20HSC-3: No. 7099232



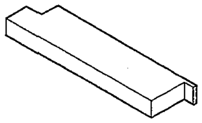
2. **Cassette Torque Meter**
SRK-8T-232: No. 7099236
SRK-8T-212: No. 7099402



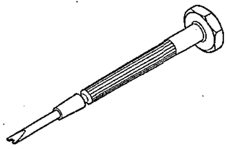
3. **Master Plane**
No.7099237



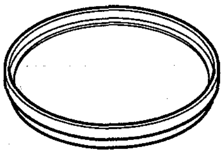
4. **Reel Disk Height Jig**
No. 7099238



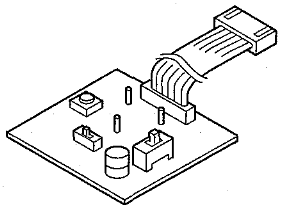
5. **Special Driver**
No. 7099239



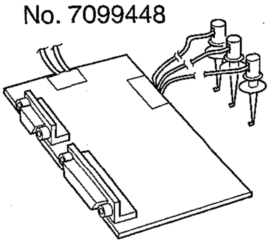
6. **C12 Light Balance Filter**
No. 7099369



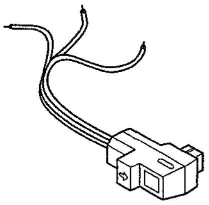
7. **ATF-R Jig** *(*1,*2)*
No. 7099461



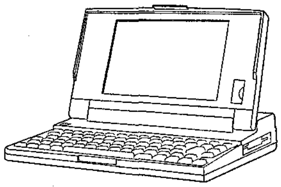
8. **DSP-R jig**
No. 7099448



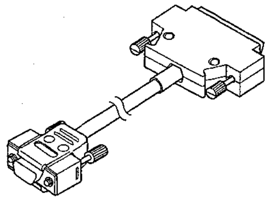
9. **DSP AV Output Jig**
No. 7099456



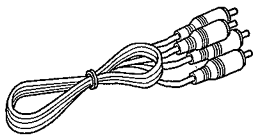
10. **Presonal Computer**
[Goods on the market]



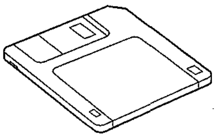
11. **Personal Computer Cable**
RS-232C (9-pin or 25-pin)
Straight Type Cable
[Goods on the market]



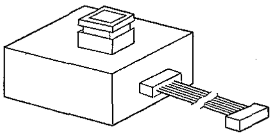
12. **AVOutput Cable** *(*3)*
[Accessory]



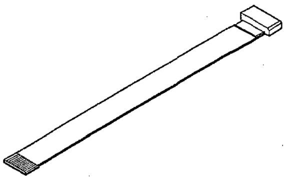
13. **Adjustment Floppy Disk** ***[New Jig]***
No. TP12111



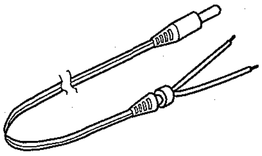
14. **8 - 20 Pin Extention Cable** ***[New Jig]***
No. TS15411



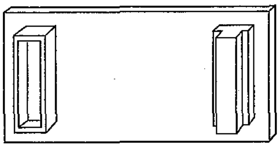
15. **4-Pin Extension Cable**
No.7069203



16. **ODC DC CORD**
No. TE13171



17. **80-Pin Extention Board** ***[New Jig]***
No. JP25461



Caution for jigs :

*1. Always set SW3 on the ATF-R jig to ON.
*2. The ATF jig (No.7099386) can also be used in place of ATF-R jig to adjust this model.
*3. Either the monaural or stereo AV output cable can be used.

HOW TO USE THE EXTENSION CABLES AND JIGS

Name of Jig	**Parts No.**	**How to Use**
8 - 20 Pin Extention Cable	TS15411	Used for electrical adjustment. Connected between PG905 on the VCA circuit board and DSP Output Jig (20 pins). Refer to Fig. 1-1 on the page 3-1.
4-Pin Extension Cable	7069203	Installed between the VCA circuit board and mode switch (mechanism state switch).
ODC DC Cord	TE13171	Power supply cable for power shut off level (ODC) adjustment. Refer to Fig. 1-1 on the page 3-1. Positive: Black Negative: Black & White
80-Pin Extension Board	JP25461	Installed between the VCA circuit board and CON circuit board.

SERVICE POSITION

NOTE :

1. If the front cover assembly is connected to the VCA circuit board, the provided remote control can be used to operate the camera/recorder without connecting the CON circuit board.
2. The VCR block can be operated with the camera chassis assembly removed.

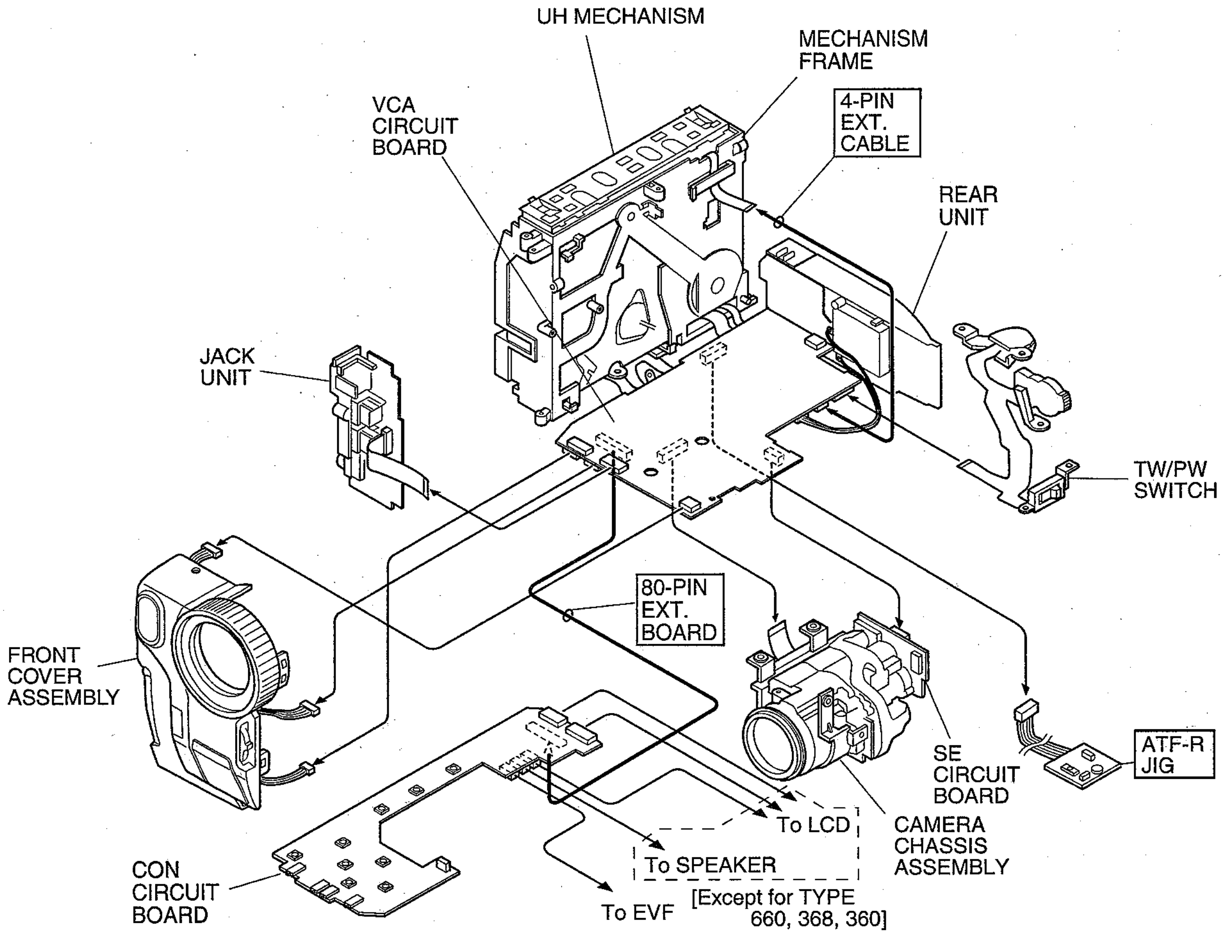

UH MECHANISM
MECHANISM FRAME
VCA CIRCUIT BOARD
4-PIN EXT. CABLE
REAR UNIT
JACK UNIT
TW/PW SWITCH
FRONT COVER ASSEMBLY
80-PIN EXT. BOARD
SE CIRCUIT BOARD
ATF-R JIG
To LCD
CAMERA CHASSIS ASSEMBLY
To SPEAKER
[Except for TYPE 660, 368, 360]
To EVF
CON CIRCUIT BOARD

Fig.1-1 Extension Cable and Jig Connection Diagram

SERVICE MANUAL ABBREVIATION LIST

A	
ACC	Automatic Color Control
A/D	Analog-to-Digital Converter
ADD	Adder
ADP.	Adapter (AC Adapter)
ADRS	Address
A.DUB	Audio Dubbing
AF	Automatic focus (Autofocus)
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
AGC KILLER	AGC Killer Voltage
AI	Automatic Intelligence
AIC	Automatic Iris Control
ALC	Automatic Level Conrol
AMP	Amplifier
APC	Automatic Phase Control
ASBL	Assemle (Phase Matching)
ATRS	Auto Tape Recording System
AUD.	Audio
AUX	Auxiliary

B	
B (BLU)	Color Signal Blue
BATT.	Battery
BF	Burst Flag
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BLC	Backlight Compensation
BLK	Blanking
BPF	Bandpass Filter
BUF.	Buffer Amplifier
B-YL	Color Difference Signal B-YL

C	
C (CHROMA)	Chrominance Signal
CAM	Camera
CAPST.	Capstan
CARRI.	Carrier
CATV	Cable TV
C.BLK	Composite Blanking
CCD	Charge Coupled Device
CDS	Correlated Double Sampling
C.FG (CFG)	Capstan Frequency Generater
C.FREE RUN	Capstan Free Run
CG	Character Generator
CH (Ch or ch)	Channel
CHARA.	Character
CHD	Camera Horizontal Drive Pulse
C.MEMORY	Counter Memory
CNR	Chroma Noise Reducer
COM.	Common
COMPA.	Comparator
COMPE.	Compensator
COMP-EXP	Compressor-Expander
COMPO	Composite
CONT.	Control
CONV.	Converter
COUNT.	Counter
CP	CP
C.PAUSE	Camp Pulse
C/R	Capacitor/Resistor
C.RESET	Countor Reset or Camera Reset
C.REVERSE	Count Reverse
CS	Communication Signal
CST	Cassette

C	
C.SYNC	Composite Synchronizing Signal
CTL	Control Track Pulse (Control)
CYL	Cylinder

D	
D (Digital)	Digital
DA	Double Azimuth
D/A	Digital to Analog Converter
D-D	Direct Drive
DEEMPHA.	Deephasis
DEF	Deflefction
DEMOD.	Demodulator
DET	Detector
DIFF. AMP	Differential Amplifier
DISP.	Display
DL	Delay Line
DO	Dropout
DOC	Dropout Compensator
DSP	Digital Signal Processor
DUB	Dubbing
DV	Digital Video Format
DVD	Digital Video Disk
D-VHS	Digital VHS
D/W	Dark/White
D.ZOOM (DZ)	Digital Zoom

E	
EAROM (EA-ROM)	Electrically Alterable Read Only Memory
E-E	Electronic-to-Electronic
EEPROM (EEP-ROM)	Electrical Erasable Proframmed
EIS (E.I.S.)	Electronic Image Stabilizer
EMPHA. (EMPH)	Emphasis
EQ	Equalizer
ESS	End Sensor Supply (Supply End Sensor)
EST	End Sensor Take-up (Take-up End Sensor)
EVF	Electronic Viewfinder
EXT.	External
E.ZOOM	Electrolical Zoom

F	
F.ADV	Frame Advance
FB	Feed back
FE	Full Erase
FF (F/F)	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FM	Frequency Modulation
FREQ.	Frequency
fsc	Sub Carrier Frequency
F/V	Frequency-to-Voltage Converter
FWD	Forward

G	
G (GRN)	B (BLU) Color Signal Green
GEN.	Generator
GND	Ground

H	
H (HORIZ.)	Horizontal
HB	Hi-Band
HBF	Horizontal Burst Flag
HD	Horizontal Drive

H

Hi-Fi	High Fidelity
HPF	High-pass Filter
HSW	Head Switch

I

IF	Intermediate Frequency
INDI.	Indicator
INST.	Instant
INT.	Internal
INV.	Inverter
I/O	In/Out (Input/Output)
IR	Infrared Rays

L

LB	Low-Band
LCD	Liquid Crystal Dissplay
LIN.	Linear
LM	Loading Motor
LNC	Line Noise Canceller
LOG	Logarithm
LP	Long Play
LPF	Low-pass Filter
L/R	Left/Right
LUMA	Luminance

M

MAN	Manual
M.BRAKE	Main Brake
M.CUT	Monitor Cut
MEM.	Memory
MIC	Microphone
MIX	Mixer
MMV	Monostable Multivibator
MOD.	Modulator
MPEG	Noving Picture coding Experts Group
M.STATE	Mechanism State
M.STOP	Memory Stop

N

NEG	Negative
NFB	Negative Feed Back
NOR. (NORM)	Normal
NR	Noise Reduction

O

OB	Optial Black
OSC	Oscillator
OSD	On-Screen Display

P

PB (PLAY)	Playback
PCM	Pulse Code Modulation
PG	Pulse Generator
PLL	Phase Locked Loop
POS.	Positive
PROG.	Program
PROT.	Protector
PWM	Pulse Width Modulation

R

R (RED)	Color Signal Red
RAM	Random Access Memory
REC	Record
RECT.	Rectifier
REF.	Reference
REG.	Regulator
REV	Review
REW	Rewind

R

RF	Radio Frequency
ROM	Read Only Memory
RSS	Reel Sensor Supply (Supply Reel Sensor)
RST	Reel Sensor Take-up (Take-up Reel Sensor)
R-YL	Color Difference Signal R-YL

S

SAW	Sawtooth Signal
SC1 (0°)	3.58MHz Subcarrier Signal 1 (0-degree Phase Shifted)
SC2 (90°)	3.58MHz Subcarrier Signal 2 (90-degree Phase Shifted)
SEPA. (SEP)	Separator
S/H	Samle and Hold
SP	Standard Play or Speaker
S.REEL	Supply Reel Sensor
SRCH	Search
SRV	Servo
STABI.	Stabilizer
S.TRACK	Slow Tracking
STBY	Standby Mode
S-VHS	Super VHS
SW	Switch
SW30Hz	30Hz Head Switching Pulse
(15 or 25Hz)	(15 or 25Hz Head Switching Pulse)
SYNC	Synchronizing signal
SYS.CON	System Control

T

T (TELE)	Telephoto Angle
TAPE +	Recording Hi-8 Quality Image on Normal Tape
TBC	Time Base Corrector
T.BRAKE	Take-up Brake
TP	Test Point
T.REEL	Take-up Reel Sensor
TRS	Transfer

V

V (VERT.)	Vertical
V.AGC	AGC Voltage
VCO	Voltage Controlled Oscillator
VCXO	Voltage Controlled Crystal Oscillator
VD	Vertical Drive
V.DUB	Video Dubbing
VHS	Video Home System
VOL.	Volume
VP	Voltage Pulse

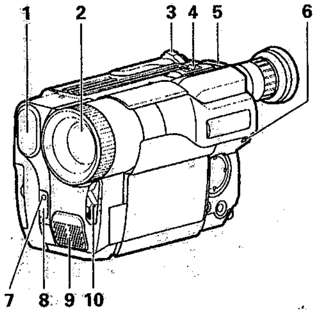
W

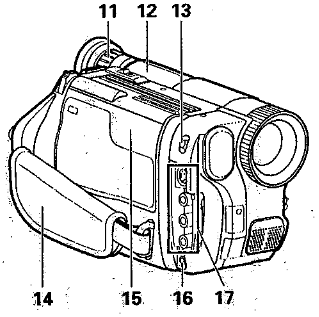
W (WIDE)	Wide Angle
WHD	Wide Horizontal Drive
WHT	Color Sifnal White
WHT BAL.	White Balance

Y

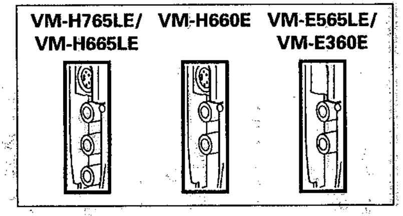
Y	Luminance Signal
Y/C	Luminance/Chrominance
YEL (Ye)	Color Signal Yellow
YL	Luminance Signal (Low Component)

IDENTIFYING CONTROLS

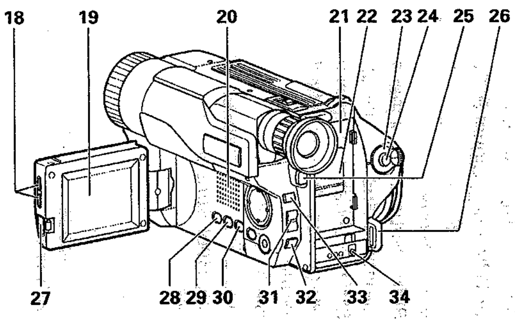




1. **Built-in DC Light (p54) (for VM-H765LE)**
2. **Lens Door (p24)**
The lens door will open automatically when the camera/recorder is set to the camera (CAM) mode.
3. **Power Zoom Control (p32)**
4. **Cassette Eject Switch (p18)**
5. **Shoulder Strap Slot (p12)**
6. **Charge Indicator (p13)**
7. **Record Indicator (p24)**
8. **Infrared Receiver (p24)**
9. **Microphone**
10. **CAM/OFF/VIDEO Power Switch (p24)**
CAM: Set to this position to record.
VIDEO: Set to this position to play back a tape.
11. **Diopter Control (p11)**
To adjust the viewfinder eyepiece to suit your eyesight.
12. **Electronic Viewfinder (p11)**
13. **DC Light Switch (p54) (for VM-H765LE)**
To switch the DC light between ON, OFF and AUTO.
14. **Hand Strap (p12)**
15. **Cassette Holder (p18)**
Insert cassette here.
16. **Microphone Jack (for VM-H765LE/VM-H665LE/VM-E565LE)**
Connect external microphone (not supplied) here.
17. **Audio/Video Output Jacks (Behind the jack cover) (p49)**
Connect the provided AV cable from this jack to the AV input jack of your TV or VCR.
The jacks on camera/recorder differ for each model as follows:
VM-H765LE/VM-H665LE has S-VIDEO jack and stereo audio output jacks.
VM-H660E has S-VIDEO jack and monaural audio output jack.
VM-E565LE/VM-E360E has monaural audio output jack.

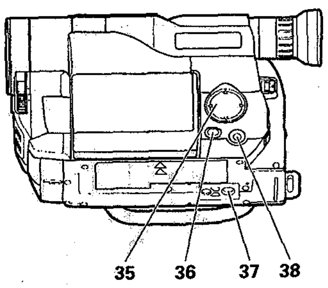


IDENTIFYING CONTROLS



18. **LCD Brightness Controls (p9) (for VM-H765LE/VM-H665LE/VM-E565LE)**
19. **2.5-inch LCD Monitor (p9) (for VM-H765LE/VM-H665LE/VM-E565LE)**
20. **Speaker (p9) (for VM-H765LE/VM-H665LE/VM-E565LE)**
21. **Power Supply Attachment Section (p16)**
22. **Clock Battery Compartment (p8)**
23. **Sub Power Switch (p24)**
STANDBY: Pressing the Start/Stop button will start recording.
LOCK: The camera/recorder will not enter the record mode even if the Start/Stop button is pressed.
24. **Start/Stop Button (p24, 28)**
This works as a recording Start/Stop button in the CAM mode and as a playback pause button in the VIDEO mode.
25. **BATT. EJECT Lever (p14)**
Sliding, and then holding, this switch, remove the battery from the camera/recorder.
26. **Shoulder Strap Slot (p12)**
27. **LCD Monitor OPEN Button (p14) (for VM-H765LE/VM-H665LE/VM-E565LE)**
To open the LCD monitor.
28. **DATE Button (p29)**
To set the date or display it.
29. **TITLE Button (p43)**
To select or create a title, or display one.
30. **EFFECT Button (p34)**
To record digitally processed image or play back picture with digital effect added.
31. **FOCUS Control Buttons (p32)**
CAM mode: To switch between auto focus and manual focus, or to control focus while in manual focus mode.
For VM-H765LE/VM-H665LE/VM-E565LE:
In the VIDEO mode, you can control playback volume. (See page 26)
32. **BLC (Backlight Compensation) Button (p40)**
When recording a subject in bright light, hold this button down to compensate for lighting on tape.
33. **MENU Button (p20)**
To display the menu.
34. **DC IN Jack (p17)**
Use this jack to power the camera/recorder from the AC adapter or from battery in your vehicle.

IDENTIFYING CONTROLS



35. Tape Transport and Menu Setting Buttons (p20, 26)

Tape Transport Buttons:

▶ PLAY: To play back tape.
◀◀ REW: To rewind tape.
■ STOP: To stop tape.
▶▶ FWD: To fast forward tape.

Menu Setting Buttons:

To select menu items and set details.

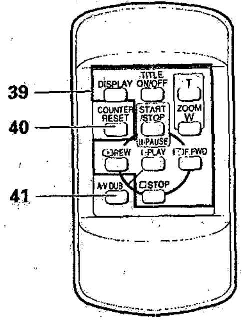
36. FADE Button (p36)

To select the desired fade mode.

37. Tripod Mounting Threaded Socket

38. PROGRAM AE Button (p39) (for VM-H765LE/VM-H665LE/VM-E565LE/VM-H660E)

To change the exposure.



REMOTE CONTROL

39. Recorder Remote Control

Same functions as the corresponding buttons on the camera/recorder.

40. COUNTER RESET Button (only on the remote control) (p48)

To reset the time counter to 0:00:00.

41. A/V DUB Button (only on the remote control) (p52)

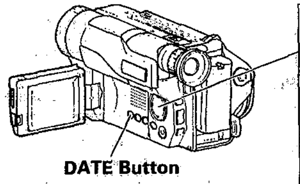
To dub audio and video.

DATE/TIME SETTING

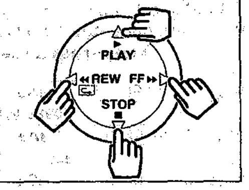
The date and time can be recorded on your tapes to act as a handy reference when viewing them at a later time. Use the following procedure to set up this display for the current date and time.

Make sure that the current time is displayed correctly before you start recording.

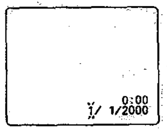
NOTE: Be sure to insert the clock battery before setting the date and time. Although the date and time can be set without the clock battery inserted, they will disappear when the battery providing power to the camera/recorder is removed.



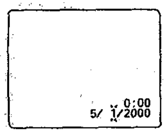
Date Select Buttons



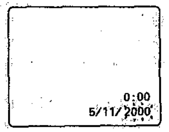
1. Slide the CAM/OFF/VIDEO switch to "CAM".
2. Press the DATE button. "0:00" and "1/1/2000" appears on the monitor screen and "1" flashes.



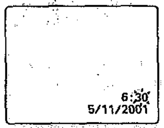
3. Press the PLAY or STOP button to select correct date. Pressing the PLAY button gives you higher numbers while the STOP button gives you lower numbers. When the correct date appears, press the FF button.



4. Press the PLAY or STOP button to select correct month. When the correct month appears, press the FF button.



5. Use the PLAY, STOP and FF buttons to select the correct year, hour and minute.



6. After setting to the correct minute, press the DATE button to change the display and start the internal clock. It is recommended that you press the DATE button to match the time signal.

NOTE: After the date and time are set, "◷ AUTO" appears and the camera/recorder enters the automatic date recording mode. See "DATE RECORDING" on page 30.

■ **To correct date/time after starting the date/time**

1. Hold down the DATE button for at least 3 seconds: The flashing cursor will appear at the date.
2. Correct the incorrect digit by using the PLAY, STOP and FF buttons.

■ **To correct date/time during programming**

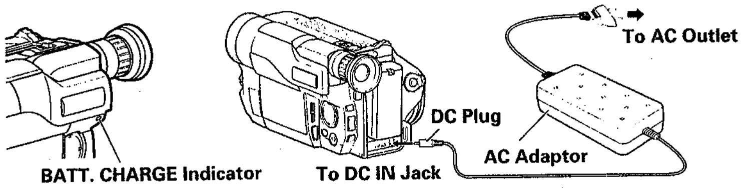
1. Press the FF button repeatedly until the digit that is incorrect flashes.
2. Correct the incorrect digit by using the PLAY, STOP and FF buttons.

CHARGING THE BATTERY

The first step is to set the battery for charging. To charge the battery, attach it to the camera/recorder, and connect the VM-ACE5E AC adaptor. Charge the battery at a temperature range of 10°C – 30°C to prevent damage to the battery.

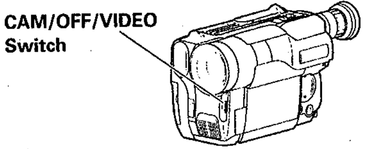
NOTES:

- This camera/recorder operates with a lithium ion battery such as VM-BPL13/VM-BPL30/VM-BPL60.
- We cannot be responsible for any malfunctions of the camera/recorder which occur when you use battery packs other than those specified.

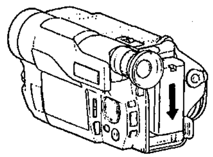


Charge the battery on a flat surface that is free of vibration.

1. Make sure the CAM/OFF/VIDEO switch is set to OFF position.



2. Attach the battery pack to the camera/recorder.
   - Place the battery on the guide platform and slide it down so that it fits into the camera/recorder.



NOTE: Always attach a battery only by the procedure described here. Attaching a battery forcibly could damage it.

3. Plug the AC adaptor power cord into an AC outlet.
4. Connect the AC adaptor DC plug to the DC IN jack of the camera/recorder. Charging will start within five seconds. During charging, the BATT. CHARGE indicator of the camera/recorder will flash or light to give you a reference of the charged level.

NOTES:

- **If the BATT. CHARGE indicator flashes once every two seconds, the battery could be defective.**
- **The BATT. CHARGE indicator will not light at all when the AC adaptor is defective.**
- You can use the battery before it is completely charged.
- When charging is complete, the BATT. CHARGE indicator on the camera/recorder will light. If the fully charged battery is removed and then re-attached, the camera/recorder will again enter the charge mode, and the BATT. CHARGE indicator will flash. It will take a few minutes for the camera/recorder to enter the charge complete status.
- Charging at low temperatures will decrease charge capacity.

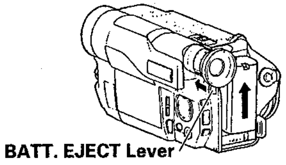
5. After charging is complete, disconnect the AC adaptor DC plug from the camera/recorder.
6. Disconnect the AC plug from the AC outlet.
7. Detach the battery from the camera/recorder.

NOTES:

- Always remove the battery from the camera/recorder after use.
- Charging is not done when the CAM/OFF/VIDEO switch of the camera/recorder is set to CAM or VIDEO. However, if recording pause continues for more than 5 minutes in the CAM mode, the camera/recorder will automatically turn off, after which charging will start. If the sub-power switch is set to LOCK, charging will take place even when the CAM/OFF/VIDEO switch is set to CAM.
- If the DC plug is disconnected when the battery is attached and the CAM/OFF/VIDEO switch is set to CAM or VIDEO, the camera/recorder will turn off once, but then automatically turn on again. Note that the battery will discharge if the camera/recorder is left as it is.

■ Removing the battery pack

Slide the BATT. EJECT lever in the direction of the arrow and hold it; then slide the battery to the upper side and remove.



■ Reference of charged level

You can know the approximate charge level of battery by observing how the BATT. CHARGE indicator of camera/recorder flashes or lights:

Charge level	BATT. CHARGE indicator
0-50% charge	Flashes once at approx. one-second intervals.
50-75% charge	Flashes twice at approx. one-second intervals.
More than 75% charge	Flashes three times at approx. one-second intervals.
Full charge	Steady light

■ Charging time

Battery / Charging	VM-BPL13	VM-BPL30	VM-BPL60
Full charge	3h	5h 30 min.	9h 50 min.
75% charge	1h 50 min.	3h 40 min.	7h

■ Operating time

The camera/recorder operating time depends on how often you turn power on/off and use start/stop and zoom.

Continuous recording

EVF: when using the viewfinder

LCD: when using the LCD monitor

Battery	VM-BPL13	VM-BPL30	VM-BPL60
VM-H765LE			
EVF	2h 40 min	5h 55 min	12h
LCD	2h 15 min	5h	10h 20 min
VM-H665LE			
EVF	2h 45 min	6h 5 min	12h 20 min
LCD	2h 20 min	5h 15 min	10h 40 min
VM-E565LE			
EVF	2h 50 min	6h 15 min	12h 40 min
LCD	2h 25 min	5h 30 min	11h 10 min
VM-H660E			
EVF	2h 50 min	6h 15 min	12h 40 min
VM-E360E			
EVF	2h 50 min	6h 15 min	12h 40 min

Typical recording

EVF: when using the viewfinder

LCD: when using the LCD monitor

Battery	VM-BPL13	VM-BPL30	VM-BPL60
VM-H765LE			
EVF	1h 35 min	3h 30 min	7h 10 min
LCD	1h 20 min	3h	6h 10 min
VM-H665LE			
EVF	1h 40 min	3h 35 min	7h 20 min
LCD	1h 25 min	3h 5 min	6h 20 min
VM-E565LE			
EVF	1h 45 min	3h 45 min	7h 35 min
LCD	1h 30 min	3h 15 min	6h 40 min
VM-H660E			
EVF	1h 45 min	3h 45 min	7h 35 min
VM-E360E			
EVF	1h 45 min	3h 45 min	7h 35 min

Notes on the battery

- It is recommended that the battery always be left in the discharged state when not in use, and charged before you use it.
- Avoid storing a fully charged battery, and do not store it in a place where the temperature is high: this will damage the battery.

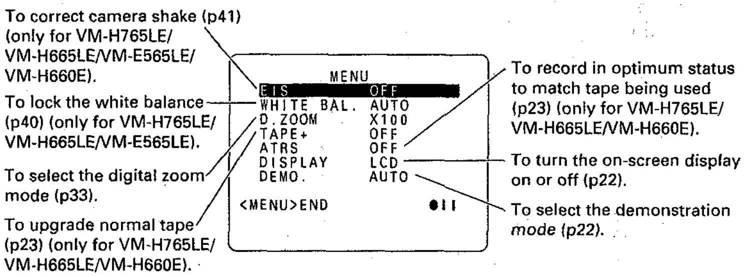
(continued on next page)

ITEMS SELECTABLE WITH MENU DISPLAYS

The items that can be selected depend on the position of CAM/OFF/VIDEO switch.
NOTE: The VM-H765LE menu displays are used for the following explanation. Some items do not appear, depending on the model.

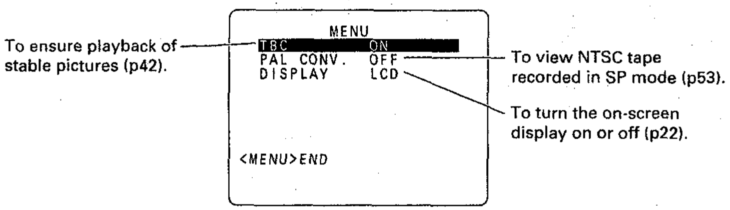
Menu selectable in the CAM mode

When the MENU button is pressed, the following menu display will appear:


To correct camera shake (p41) (only for VM-H765LE/ VM-H665LE/VM-E565LE/ VM-H660E).
To lock the white balance (p40) (only for VM-H765LE/ VM-H665LE/VM-E565LE).
To select the digital zoom mode (p33).
To upgrade normal tape (p23) (only for VM-H765LE/ VM-H665LE/VM-H660E).
MENU
EIS OFF
WHITE BAL. AUTO
D.ZOOM X100
TAPE+ OFF
ATRS OFF
DISPLAY LCD
DEMO. AUTO
<MENU>END
To record in optimum status to match tape being used (p23) (only for VM-H765LE/ VM-H665LE/VM-H660E).
To turn the on-screen display on or off (p22).
To select the demonstration mode (p22).

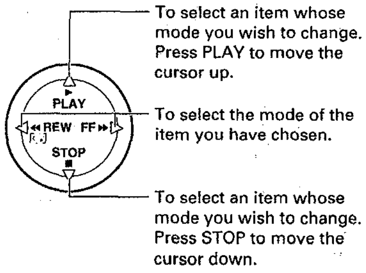
Menu selectable in the VIDEO mode

Pressing the MENU button will display the following:


To ensure playback of stable pictures (p42).
MENU
TBC ON
PAL CONV. OFF
DISPLAY LCD
<MENU>END
To view NTSC tape recorded in SP mode (p53).
To turn the on-screen display on or off (p22).

How to select items and set them

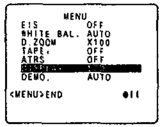
1. Press the MENU button.
2. Press the PLAY or STOP button to select the desired item.
3. Use the FF or REW button to select the desired mode.
4. Press the MENU button again to determine the mode.


To select an item whose mode you wish to change. Press PLAY to move the cursor up.
PLAY
REW
FF
STOP
To select the mode of the item you have chosen.
To select an item whose mode you wish to change. Press STOP to move the cursor down.

SWITCHING ON-SCREEN DISPLAY ON/OFF

Using menu selection, you can turn off the camera/recorder status display during recording and playback, and turn it on again afterwards.

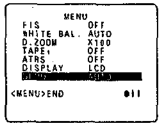
NOTE for VM-H660E/VM-E360E: Since this model is not equipped with LCD monitor, "EVF" will appear instead of "LCD" for menu item "DISPLAY".


MENU
EIS OFF
WHITE BAL. AUTO
D.ZOOM X100
TAPE+ OFF
ATRS OFF
DISPLAY
DEMO. AUTO
<MENU>END

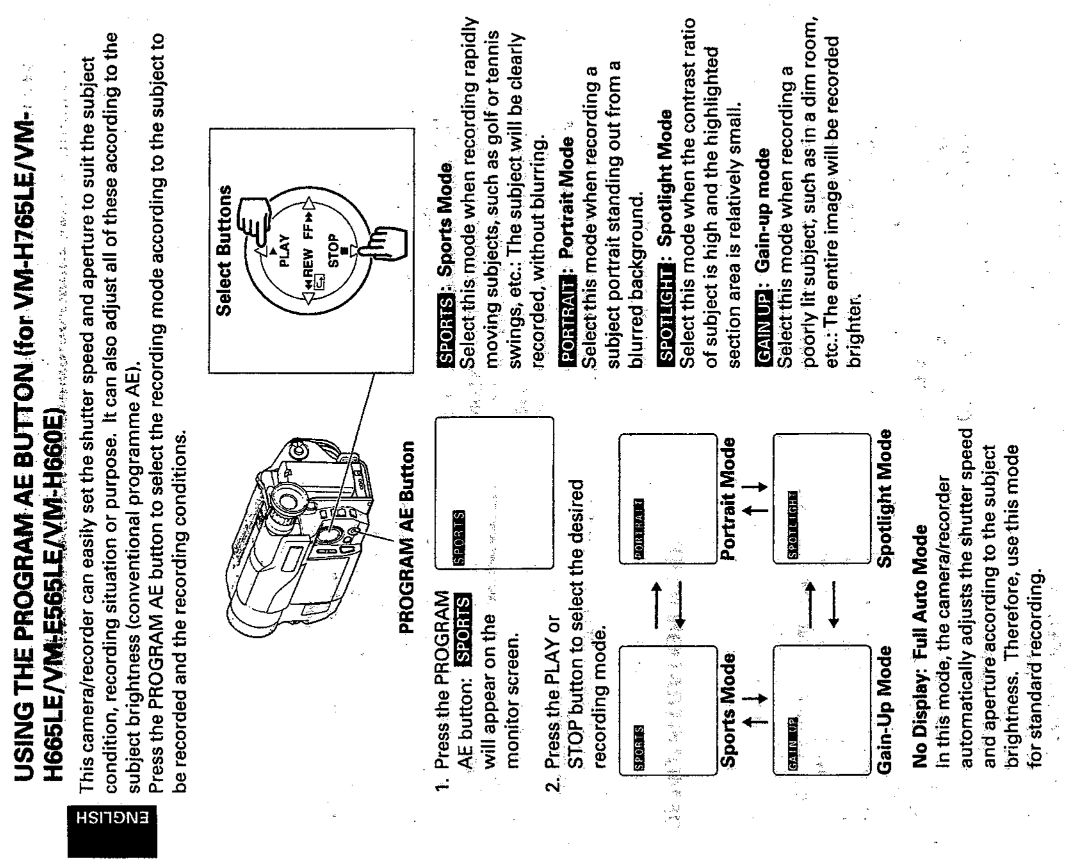
1. Set the CAM/OFF/VIDEO switch to CAM.
2. Press the MENU button.
3. Press the PLAY or STOP button to select "DISPLAY".
4. Press the REW or FF button to select the desired mode:
   LCD (or EVF): Information on the tape remaining, time counter, etc. is displayed on the monitor screen.
   LCD/LINE (or EVF/LINE): M is displayed beside the time counter ("Memory Feature", p48). When LCD/LINE (or EVF/LINE) is specified, you can view the information in the memory displayed on the monitor screen, which will be superimposed on the playback picture seen on the connected TV.
   OFF: Information on tape remaining, time counter, etc. is not displayed.
   NOTES:
   - The battery remaining power level will be displayed when you use a battery pack as a power supply.
   - The date and recording status are displayed on the monitor screen.
5. Press the MENU button.

DEMONSTRATION MODE

Using the menu, you can switch the demonstration mode that is set in this camera/recorder.


MENU
EIS OFF
WHITE BAL. AUTO
D.ZOOM X100
TAPE+ OFF
ATRS OFF
DISPLAY LCD
<MENU>END

1. Set the CAM/OFF/VIDEO switch to CAM.
2. Press the MENU button.
3. Press the PLAY or STOP button to select "DEMO.".
4. Press the REW or FF button to select the desired mode:
   AUTO: If you leave the camera/recorder for 10 minutes without inserting a cassette when no date has been set, or the clock battery is dead, the demonstration mode will automatically *engage.*
   START: The demonstration mode will also start after the MENU button is pressed and START is specified.
   OFF: The demonstration mode is off.
5. Press the MENU button.
   NOTE: The demonstration mode will continue until power is turned off, or the MENU button is pressed and "AUTO" or "OFF" is specified.



ENGLISH

USING THE PROGRAM AE BUTTON (for VM-H765LE/VM-H665LE/VM-E565LE/VM-H660E)

This camera/recorder can easily set the shutter speed and aperture to suit the subject condition, recording situation or purpose. It can also adjust all of these according to the subject brightness (conventional programme AE).
Press the PROGRAM AE button to select the recording mode according to the subject to be recorded and the recording conditions.

1. Press the PROGRAM AE button: SPORTS will appear on the monitor screen.
2. Press the PLAY or STOP button to select the desired recording mode.

No Display: Full Auto Mode
In this mode, the camera/recorder automatically adjusts the shutter speed and aperture according to the subject brightness. Therefore, use this mode for standard recording.

SPORTS: Sports Mode
Select this mode when recording rapidly moving subjects, such as golf or tennis swings, etc.: The subject will be clearly recorded, without blurring.

PORTRAIT: Portrait Mode
Select this mode when recording a subject portrait standing out from a blurred background.

SPOTLIGHT: Spotlight Mode
Select this mode when the contrast ratio of subject is high and the highlighted section area is relatively small.

GAIN UP: Gain-up mode
Select this mode when recording a poorly lit subject, such as in a dim room, etc.: The entire image will be recorded brighter.

39

Model of differences

	VM-H768LE(AU) VM-H768LE(SW)	VM-H765LE VM-H765LE(UK)	VM-H665LE	VM-H660E	VM-E568LE(AU) VM-E568LE(SW)
Monitor device	LCD monitor/ Viewfinder	LCD monitor/ Viewfinder	LCD monitor/ Viewfinder	Viewfinder	LCD monitor/ Viewfinder
System	Hi-8	Hi-8	Hi-8	Hi-8	Normal 8
Audio	Monaural	Stereo	Stereo	Monaural	Monaural
Built-in DC light	Yes	Yes	No	No	No
EIS function	Yes	Yes	Yes	Yes	No
Tape +	Yes	Yes	Yes	Yes	No
Programme AE	Auto/Mode select	Auto/Mode select	Auto/Mode select	Auto/Mode select	Auto

	VM-E565LE	VM-E563LE(UK)	VM-E368E(AU) VM-E368E(SW)	VM-E360E VM-E360E(UK)
Monitor device	LCD monitor/ Viewfinder	LCD monitor/ Viewfinder	Viewfinder	Viewfinder
System	Normal 8	Normal 8	Normal 8	Normal 8
Audio	Monaural	Monaural	Monaural	Monaural
Built-in DC light	No	No	No	No
EIS function	Yes	No	No	No
Tape +	No	No	No	No
Programme AE	Auto/Mode select	Auto/Mode select	Auto	Auto

CHAPTER 2 DISASSEMBLY

1. BEFORE STARTING DISASSEMBLY

(1) Dismantle and reassemble the mechanism in loading stop status, except for the following components:
- Cassette Lid
- Top Cover
- Parts on the UH mechanism

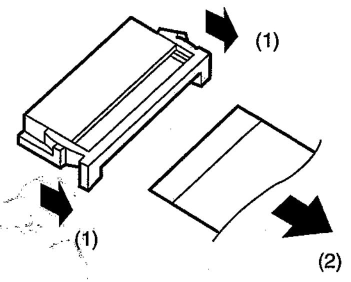
Note: After dismantling or resembling the cassette lid or top cover, return the mechanism to loading stop status.

(2) For manually operating the mechanism (unloading or loading), refer to: "How to Operate the Mechanism Manually".

(3) Dismantle each component according to "1.1 Disassembly Procedure".

(4) For reassembly, perform the reverse procedure to disassembly when not otherwise specified.

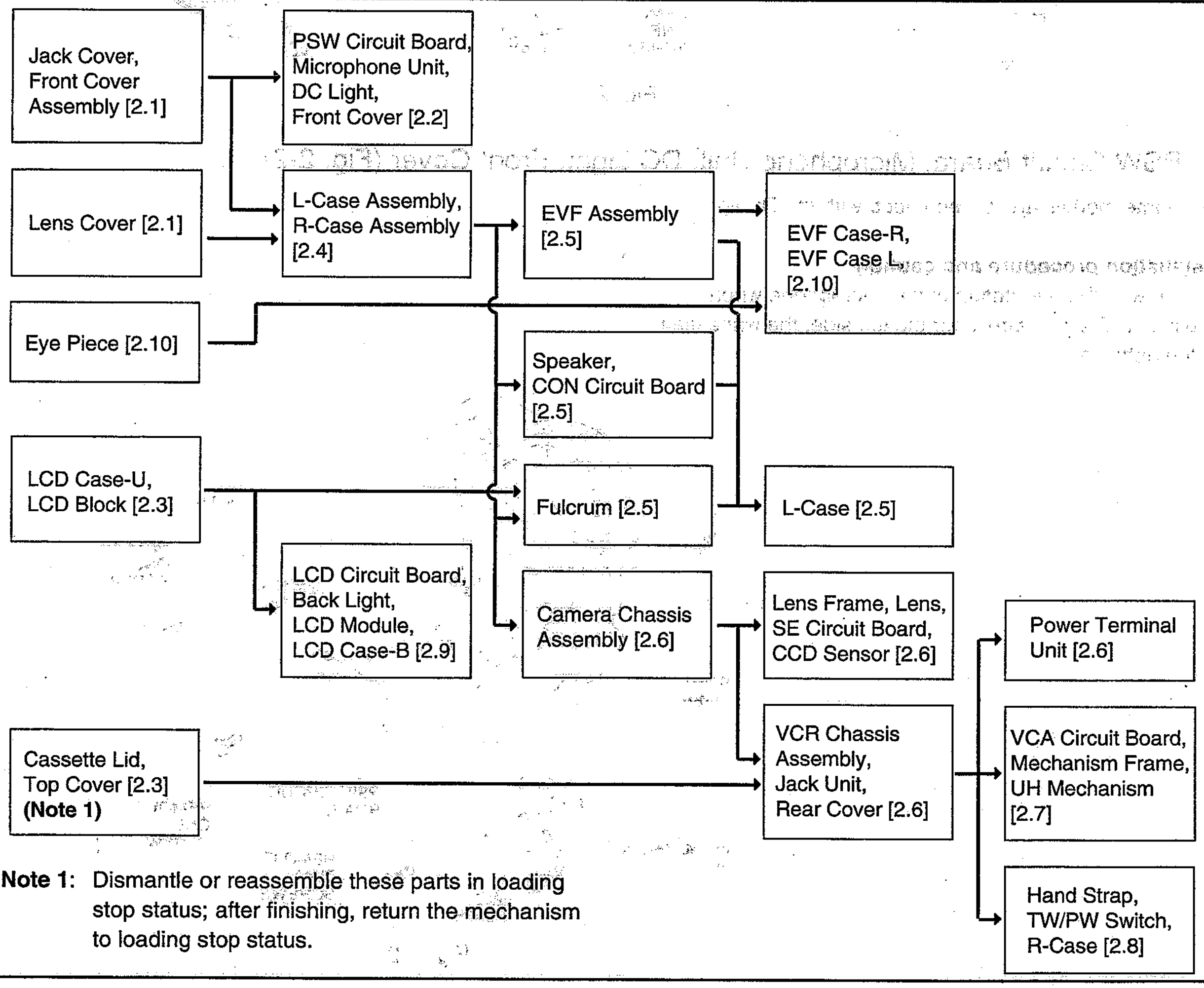
(5) Disconnect flat cables from connectors by the procedure shown in Fig. 1-1. Since many circuit boards in the camera/recorder are connected by in-board connectors, be sure to follow DISASSEMBLY when removing the circuit boards.



(1) Release the lock of the connector on the left and right simultaneously.
(2) Pull out the flat cable.

Fig. 1-1

1.1 Disassembly Procedure


Jack Cover, Front Cover Assembly [2.1]
PSW Circuit Board, Microphone Unit, DC Light, Front Cover [2.2]
Lens Cover [2.1]
L-Case Assembly, R-Case Assembly [2.4]
EVF Assembly [2.5]
EVF Case-R, EVF Case L [2.10]
Eye Piece [2.10]
Speaker, CON Circuit Board [2.5]
LCD Case-U, LCD Block [2.3]
Fulcrum [2.5]
L-Case [2.5]
LCD Circuit Board, Back Light, LCD Module, LCD Case-B [2.9]
Camera Chassis Assembly [2.6]
Lens Frame, Lens, SE Circuit Board, CCD Sensor [2.6]
Power Terminal Unit [2.6]
Cassette Lid, Top Cover [2.3] (Note 1)
VCR Chassis Assembly, Jack Unit, Rear Cover [2.6]
VCA Circuit Board, Mechanism Frame, UH Mechanism [2.7]
Hand Strap, TW/PW Switch, R-Case [2.8]

Note 1: Dismantle or reassemble these parts in loading stop status; after finishing, return the mechanism to loading stop status.

2. CASES AND CIRCUIT BOARDS REMOVAL

2.1 Jack Cover, Front Cover Assembly, Lens Cover (Fig. 2-1)

Cautions:
Be careful not to damage the cables of the microphone.

Reinstallation procedure and caution:
The O-ring must be installed in the position shown in Fig. 2-1.

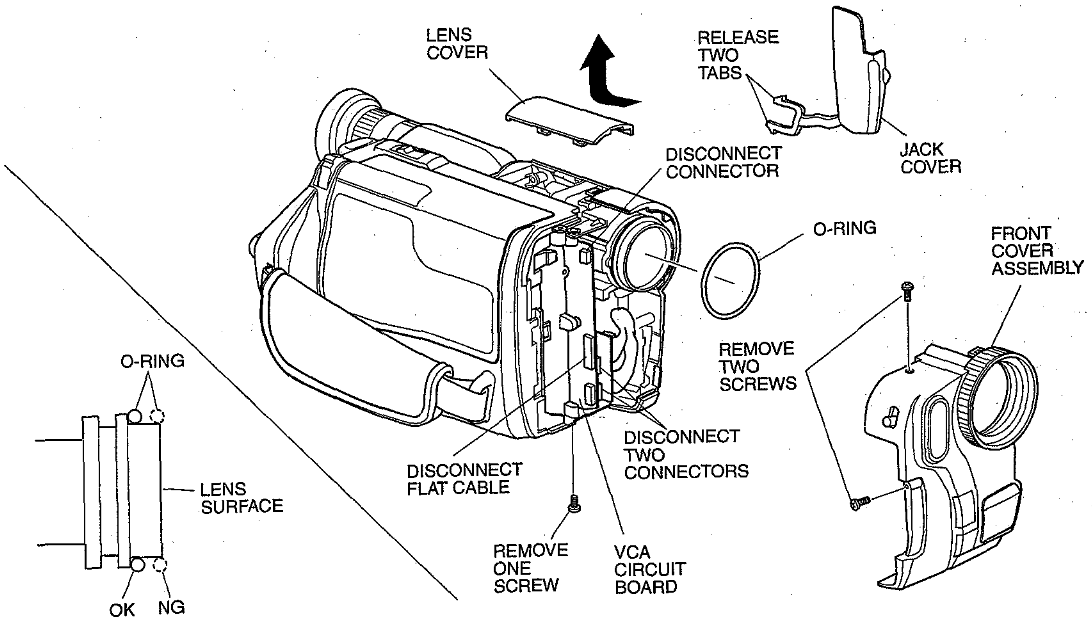

LENS COVER
RELEASE TWO TABS
JACK COVER
DISCONNECT CONNECTOR
O-RING
FRONT COVER ASSEMBLY
REMOVE TWO SCREWS
O-RING
LENS SURFACE
OK
NG
DISCONNECT FLAT CABLE
DISCONNECT TWO CONNECTORS
REMOVE ONE SCREW
VCA CIRCUIT BOARD

Fig. 2-1

2.2 PSW Circuit Board, Microphone Unit, DC Light, Front Cover (Fig. 2-2)

Note: Some models are not equipped with the DC light.

Reinstallation procedure and caution:
Take care with the orientation of the microphone when reinstalling it: The red wire is for the left side; the white lead is for the right side.

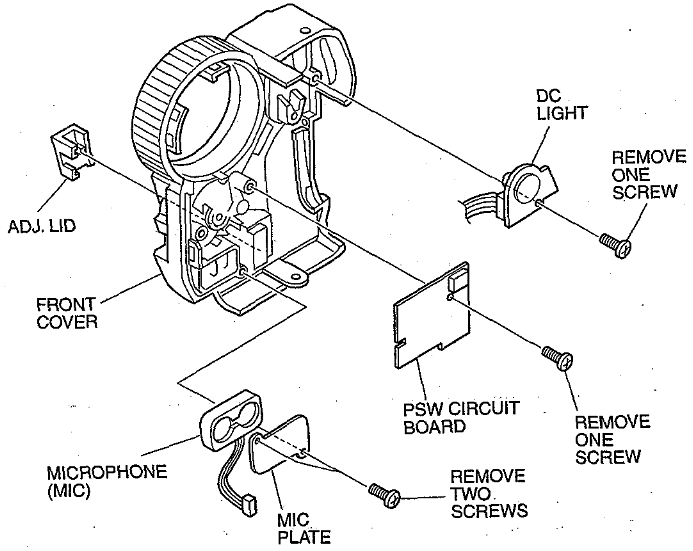

DC LIGHT
REMOVE ONE SCREW
ADJ. LID
FRONT COVER
PSW CIRCUIT BOARD
REMOVE ONE SCREW
MICROPHONE (MIC)
MIC PLATE
REMOVE TWO SCREWS

Fig. 2-2

2.3 LCD Case-U[Except for TYPE 660, 368, 360], LCD Block [Except for TYPE 660, 368, 360], Cassette Lid, Top Cover (Figs. 2-3-1, 2-3-2, 2-3-3)

Cautions:

1. Dismantle and reassemble only the cassette lid and top cover in loading stop status. After work is completed, return the mechanism to loading stop status.
2. Be careful that the LCD screen is not damaged or smudged. (If dirt adheres to it, use a soft cloth to wipe it off.)
3. Handle the LCD module and backlight with extreme care.

■ Advise of Top Cover Removal

Insert a flat-bladed screwdriver between the top cover and sub chassis, and push section (B) of the plate spring in the direction of arrow (C), to remove the top cover in the direction of the arrow. (See Fig. 2-3-3)

Reinstallation procedure and caution:

To install the cassette lid, first engage sections (A) with the cassette holder.

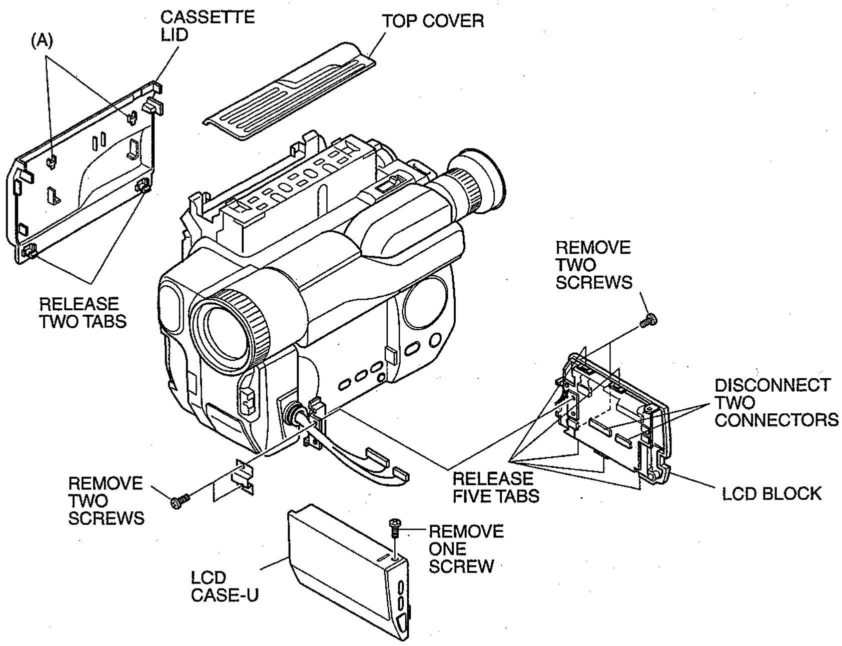

(A)
CASSETTE LID
TOP COVER
RELEASE TWO TABS
REMOVE TWO SCREWS
DISCONNECT TWO CONNECTORS
RELEASE FIVE TABS
LCD BLOCK
REMOVE TWO SCREWS
REMOVE ONE SCREW
LCD CASE-U

Fig. 2-3-1 [Except for TYPE 660, 368, 360]

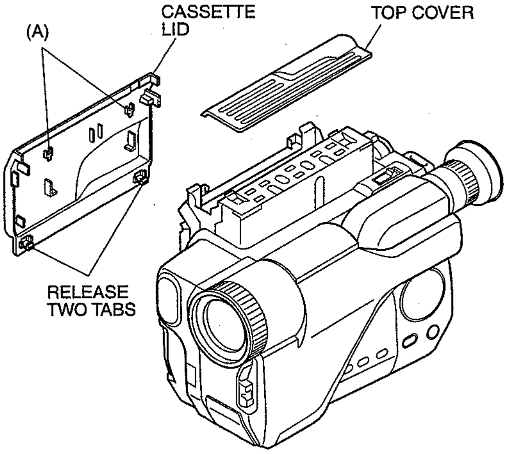

(A)
CASSETTE LID
TOP COVER
RELEASE TWO TABS

Fig. 2-3-2 [For TYPE 660, 368, 360]

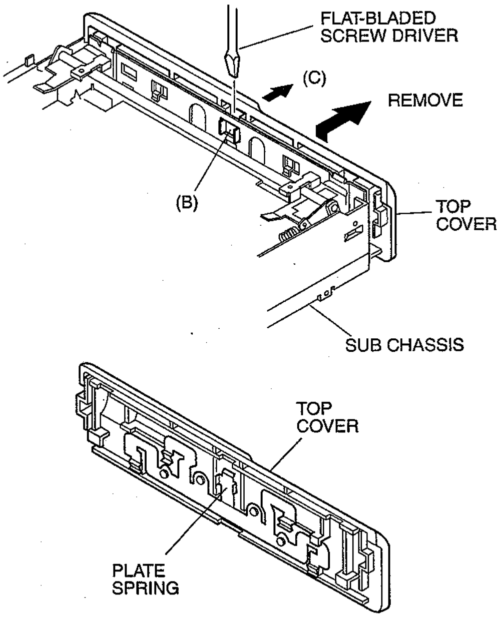

FLAT-BLADED SCREW DRIVER
(C)
REMOVE
(B)
TOP COVER
SUB CHASSIS
TOP COVER
PLATE SPRING

Fig. 2-3-3

2.4 L-Case Assembly, R-Case Assembly (Figs. 2-4-1, 2-4-2)

Caution:

Be careful so as not to damage the connectors (PG951 and PG731) between the VCA and CON circuit boards.

Reinstallation procedure and caution:

Connect connectors PG951 and PG731 securely.

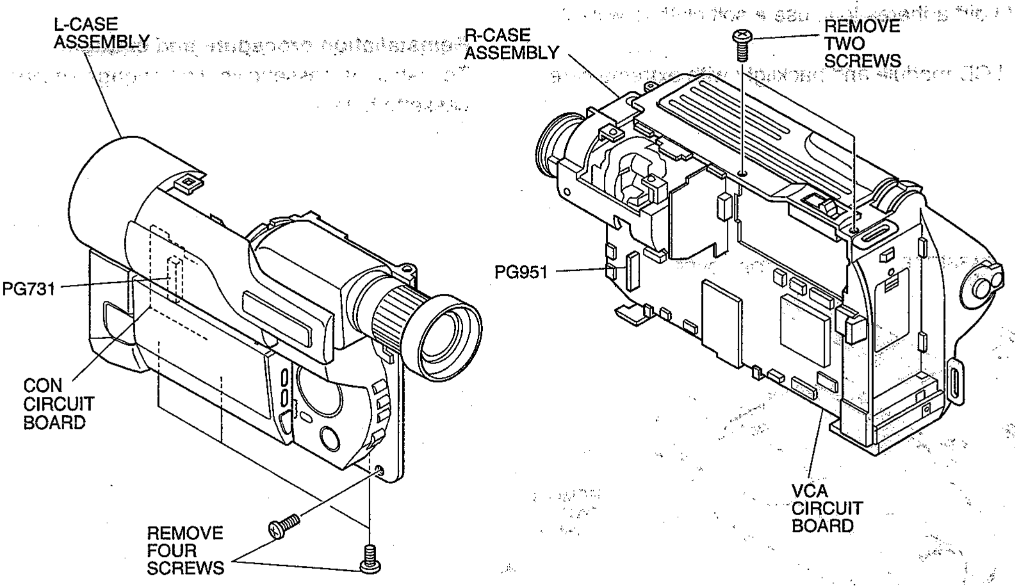

L-CASE ASSEMBLY
R-CASE ASSEMBLY
REMOVE TWO SCREWS
PG731
PG951
CON CIRCUIT BOARD
VCA CIRCUIT BOARD
REMOVE FOUR SCREWS

Fig. 2-4-1 [Except for TYPE 660, 368, 360]

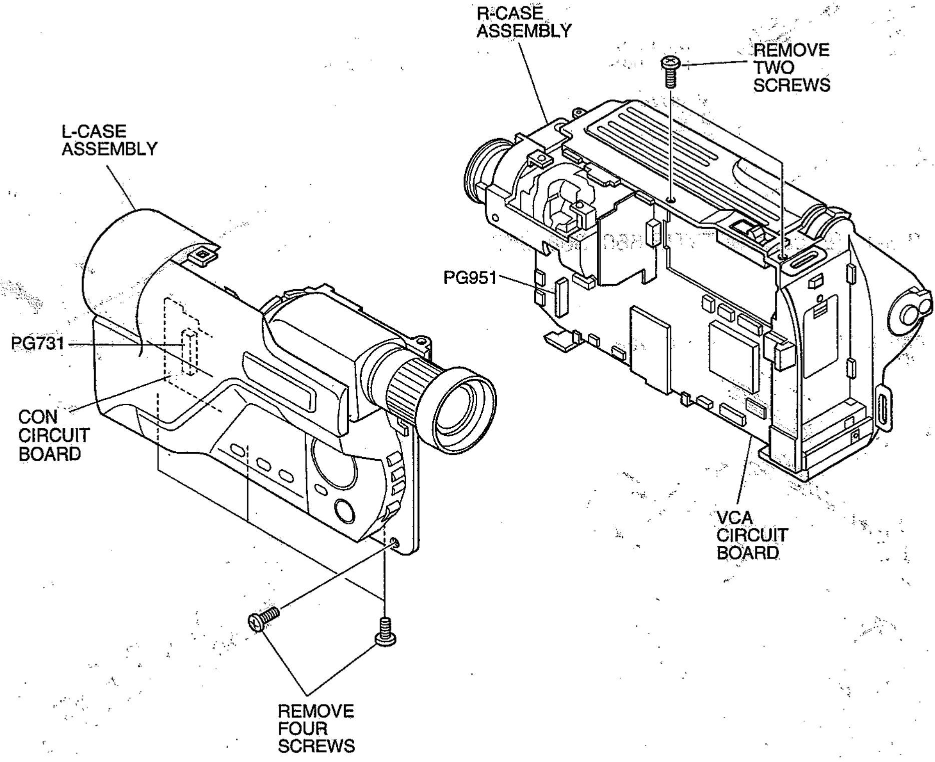

R-CASE ASSEMBLY
REMOVE TWO SCREWS
L-CASE ASSEMBLY
PG951
PG731
CON CIRCUIT BOARD
VCA CIRCUIT BOARD
REMOVE FOUR SCREWS

Fig. 2-4-2 [For TYPE 660, 368, 360]

2.5 Electronic Viewfinder (EVF) Assembly, Speaker [Except for TYPE 660, 368, 360], CON Circuit Board, Fulcrum [Except for TYPE 660, 368, 360], L-Case (Figs. 2-5-1, 2-5-2, 2-5-3)

Cautions:
Be careful not to damage the LCD Open/Close switch on the CON circuit board.

Reinstallation procedure and caution:
When reinstalling the EVF assembly, speaker, CON circuit board and fulcrum, lay out each cable as shown in Fig. 2-5-3.

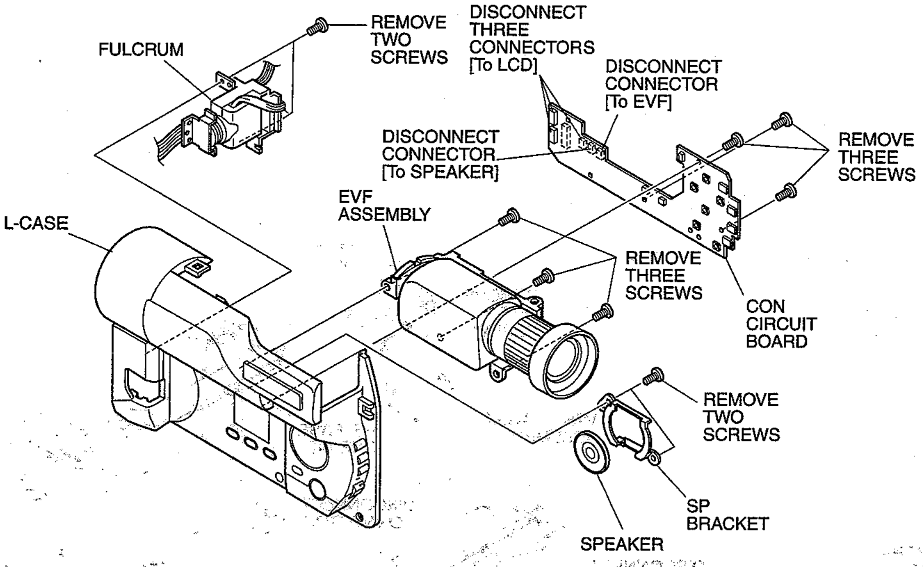

REMOVE TWO SCREWS
FULCRUM
DISCONNECT THREE CONNECTORS [To LCD]
DISCONNECT CONNECTOR [To EVF]
DISCONNECT CONNECTOR [To SPEAKER]
REMOVE THREE SCREWS
EVF ASSEMBLY
L-CASE
REMOVE THREE SCREWS
CON CIRCUIT BOARD
REMOVE TWO SCREWS
SP BRACKET
SPEAKER

Fig. 2-5-1 [Except for TYPE 660, 368, 360]

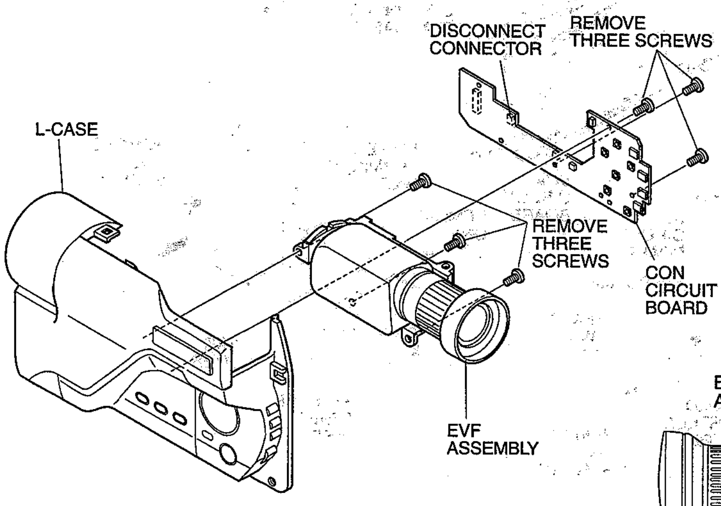

DISCONNECT CONNECTOR
REMOVE THREE SCREWS
L-CASE
REMOVE THREE SCREWS
CON CIRCUIT BOARD
EVF ASSEMBLY

Fig. 2-5-2 [For TYPE 660, 368, 360]

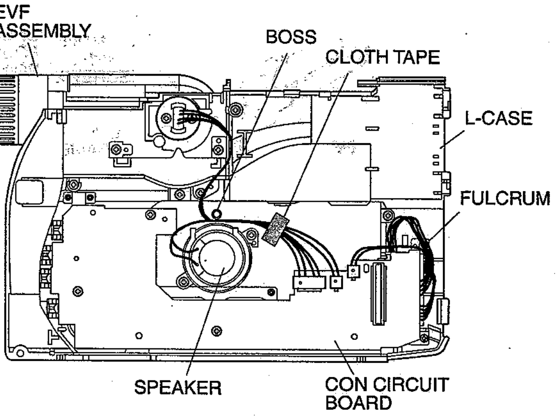

EVF ASSEMBLY
BOSS
CLOTH TAPE
L-CASE
FULCRUM
SPEAKER
CON CIRCUIT BOARD

Fig. 2-5-3

2.6 Camera Chassis Assembly (Lens Frame, Lens, SE Circuit Board, CCD Sensor), VCR Chassis Assembly, Jack Unit, Rear Cover, Power Terminal Unit (Fig. 2-6)

Cautions:

1. Be careful so as not to damage the connectors (PG201 and PG1001) between the VCA and SE circuit boards.
2. Be careful so as not to damage the connectors between the VCA circuit board (PG0001) and rear cover (power terminal unit).
3. Be careful not to damage the crystal filter and CCD sensor.

Reinstallation procedure and caution:

1. Connect connectors PG201 and PG1001 securely.
2. Connect connectors PG0001 and rear cover (power terminal unit) securely.
3. The crystal filter is non-directional.
4. Fit in the CCD sensor parallel to the SE circuit board, fix it with screws, and then solder it.

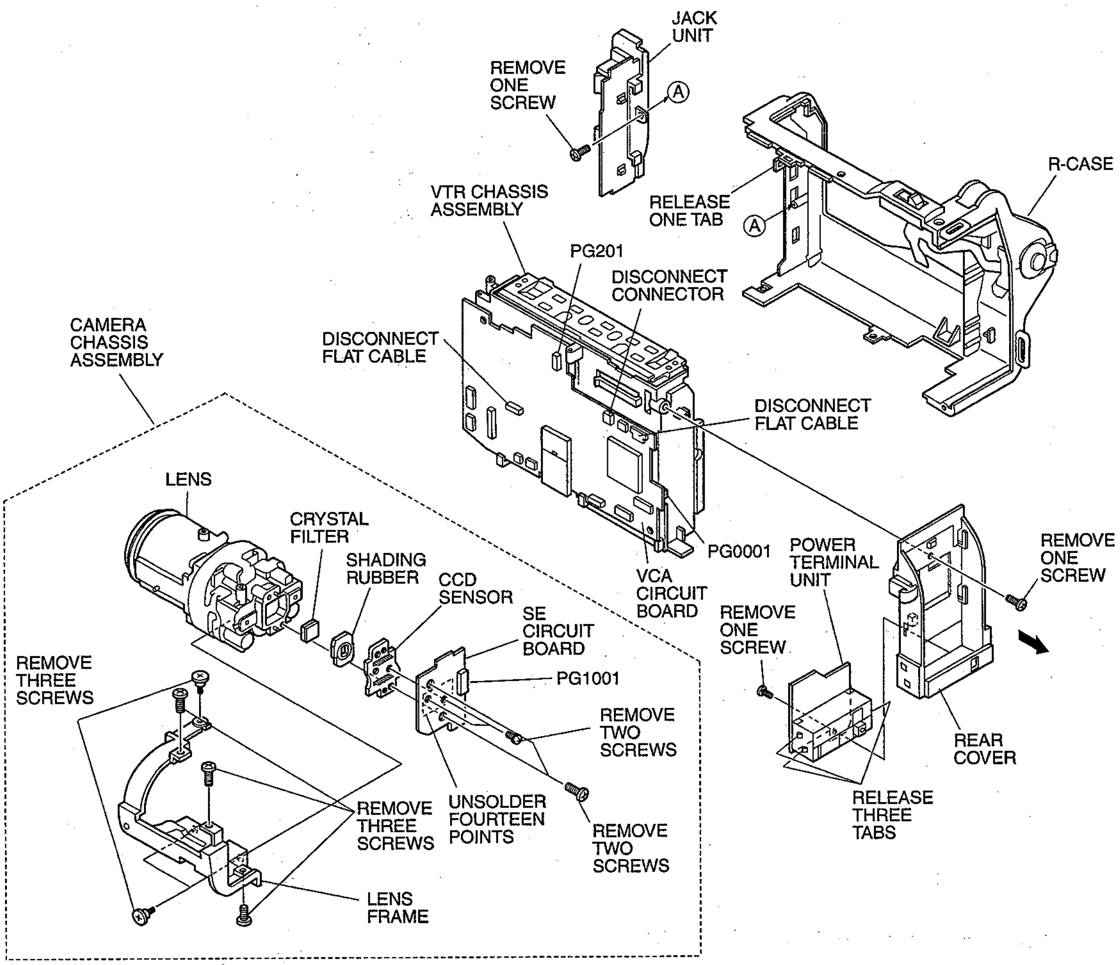

JACK UNIT
REMOVE ONE SCREW
Ⓐ
R-CASE
VTR CHASSIS ASSEMBLY
RELEASE ONE TAB
Ⓐ
PG201
DISCONNECT CONNECTOR
CAMERA CHASSIS ASSEMBLY
DISCONNECT FLAT CABLE
DISCONNECT FLAT CABLE
LENS
CRYSTAL FILTER
SHADING RUBBER
CCD SENSOR
PG0001
POWER TERMINAL UNIT
REMOVE ONE SCREW
VCA CIRCUIT BOARD
REMOVE ONE SCREW
SE CIRCUIT BOARD
REMOVE THREE SCREWS
PG1001
REMOVE TWO SCREWS
REAR COVER
REMOVE THREE SCREWS
UNSOLDER FOURTEEN POINTS
REMOVE TWO SCREWS
RELEASE THREE TABS
LENS FRAME

Fig. 2-6

2.7 VCA Circuit Board, Meacanism Frame, UH Mechanism (Fig. 2-7)

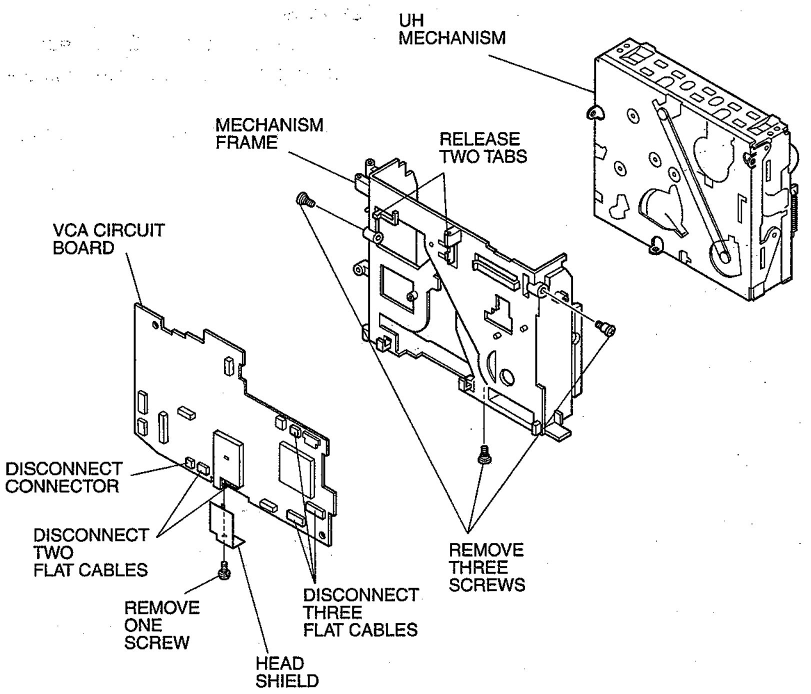

UH MECHANISM
MECHANISM FRAME
RELEASE TWO TABS
VCA CIRCUIT BOARD
DISCONNECT CONNECTOR
DISCONNECT TWO FLAT CABLES
REMOVE ONE SCREW
HEAD SHIELD
DISCONNECT THREE FLAT CABLES
REMOVE THREE SCREWS

Fig. 2-7

2.8 Hand Strap, TW/PW Switch, R-Case (Fig. 2-8)

Cautions:
Be careful not to damage the flat cable of the TW/PW switch.

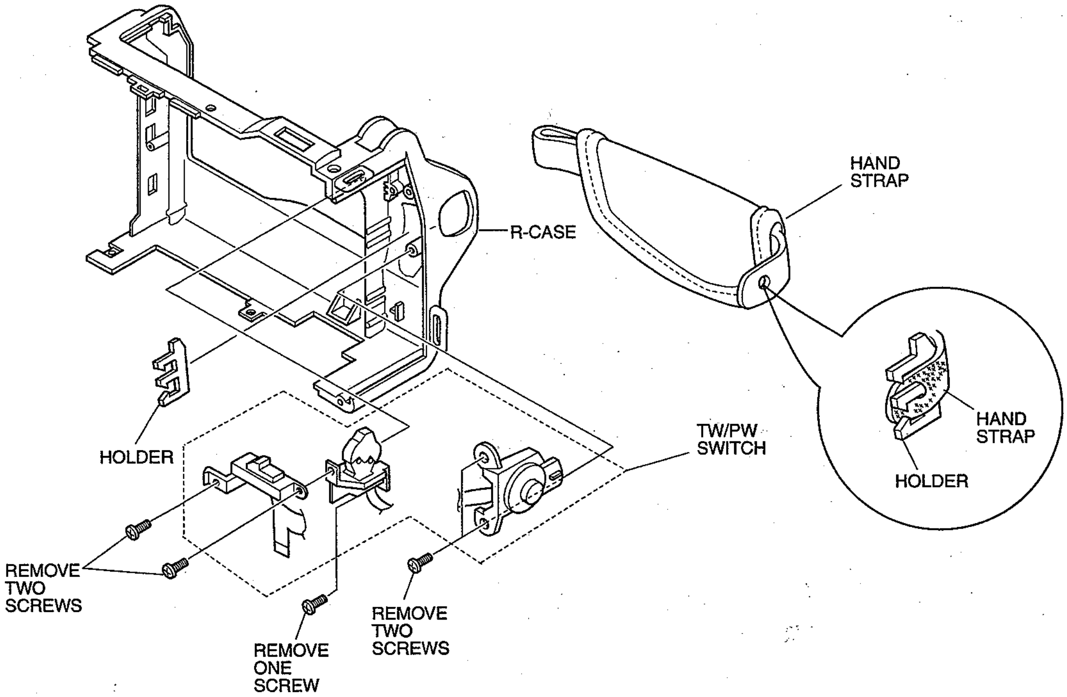

R-CASE
HAND STRAP
HOLDER
TW/PW SWITCH
HAND STRAP
HOLDER
REMOVE TWO SCREWS
REMOVE ONE SCREW
REMOVE TWO SCREWS

Fig. 2-8

2.9 LCD Circuit Borad, Back Light, LCD Module, LCD Case-B (Fig. 2-9) [Except for TYPE 660, 368, 360]

Cautions:

1. Be careful that the LCD screen is not damaged or smudged. (If dirt adheres to it, use a soft cloth to wipe it off.)
2. Handle the LCD module and backlight with extreme care.

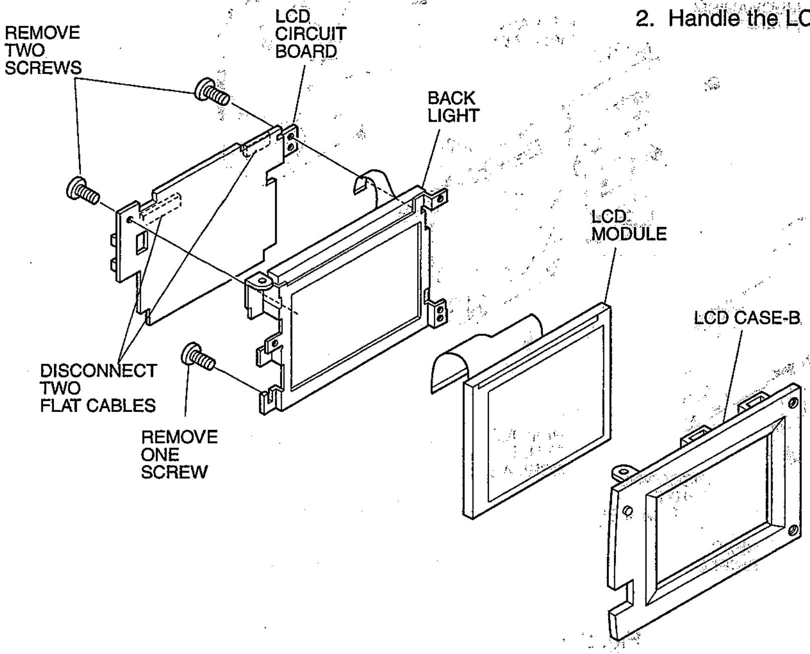

REMOVE TWO SCREWS
LCD CIRCUIT BOARD
BACK LIGHT
LCD MODULE
LCD CASE-B
DISCONNECT TWO FLAT CABLES
REMOVE ONE SCREW

Fig. 2-9 [Except for TYPE 660, 368, 360]

2.10 EVF Case-R, EVF Case-L, Eye Piece (Fig. 2-10)

Cautions:

1. Be careful not to damage the CRT.

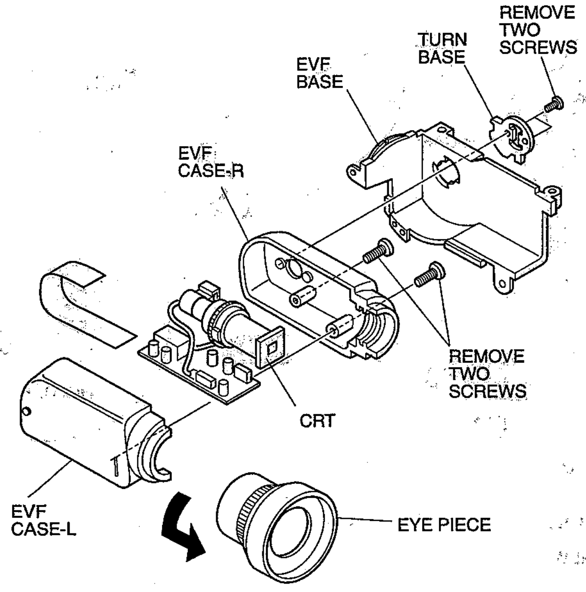

REMOVE TWO SCREWS
TURN BASE
EVF BASE
EVF CASE-R
REMOVE TWO SCREWS
CRT
EVF CASE-L
EYE PIECE

Fig. 2-10

3. HOW TO OPERATE THE MECHANISM MANUALLY

CAUTION :

Perform this procedure for emergency only when normal loading or unloading is not possible because the electrical circuits or loading motor is defective.

(1) Remove the r-case assembly. (See Fig. 2-5)
(2) Disconnect connector (CN604) from PG604 on the VCA circuit board, and supply 4V DC to CN604 (directly to the loading motor). (See Fig. 3-1)
Connecting CN604 brown wire (+) and red wire (-) results in unloading.
Connecting CN604 red wire (+) and brown wire (-) results in loading.

Note: To unload the mechanism with a tape inserted, manually turn the capstan motor simultaneously to take up the tape.

If loading or unloading does not occur even when 4V DC is directly supplied to the loading motor, perform the following procedure:

(3) Remove the camera chassis assembly and rear unit. (See Fig. 2-7)

Note: Note that it is difficult to remove the rear unit.

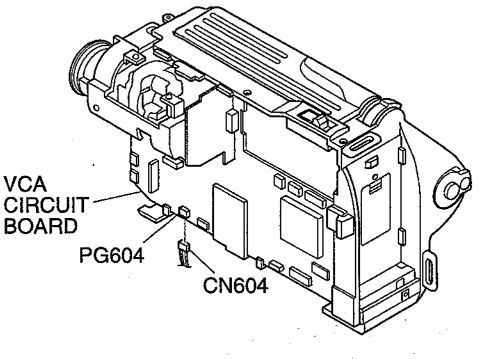


Fig. 3-1

(4) Disconnect 3 flat cables. (See Fig. 3-2)
(5) Disconnect connector. (See Fig. 3-2)
(6) Remove 1 screw holding the head shield. (See Fig.3-2)
(7) Disconnect 2 flat cables. (See Fig. 3-2)
(8) Remove 3 screws. (See Fig. 3-2)
(9) Remove the UH mechanism in the direction of the arrow from the r-case. (See Fig.3-2)
(10) Remove the cassette lid and top cover. (See Fig. 2-3)

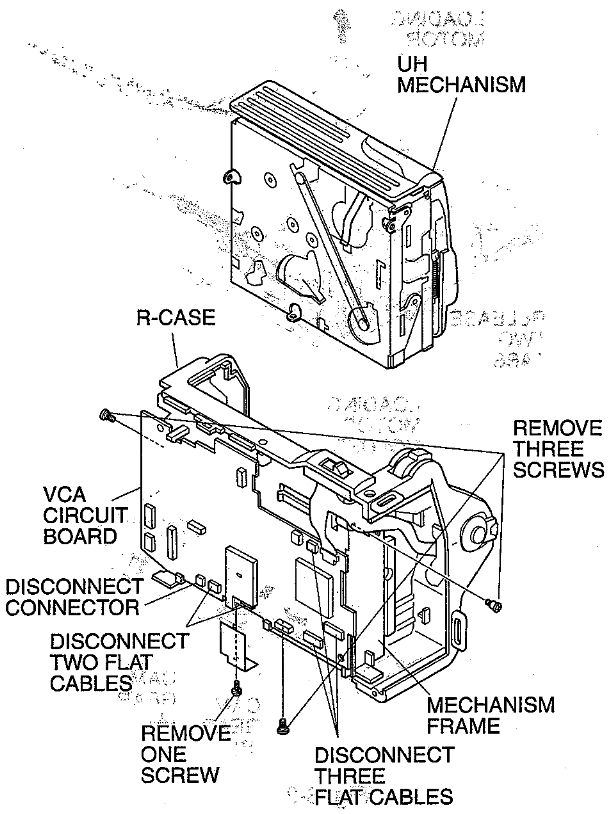


Fig. 3-2

(11) Release 2 tabs and pull out the loading motor from the loading motor holder. (See Fig. 3-3)

Note: The above removal is different from normal removal. In normal circumstances, remove the loading motor assembled with the loading motor holder. (The loading motor and loading motor holder comprise an assembly.)

(12) Turn over the mechanism. (See Fig. 3-3)

Note: Do not turn over with the idler cover removed.

(13) Use a flat-bladed screwdriver, etc. to turn cam gear (A) or (B). (See Fig. 3-3)
Turning it in the direction of the arrow will unload the mechanism, and turning it in the opposite direction to the arrow will load the mechanism.

Notes: 1. Be careful not to damage the cam gears.
2. To unload the mechanism with a tape inserted, manually turn the capstan motor simultaneously to take up the tape.

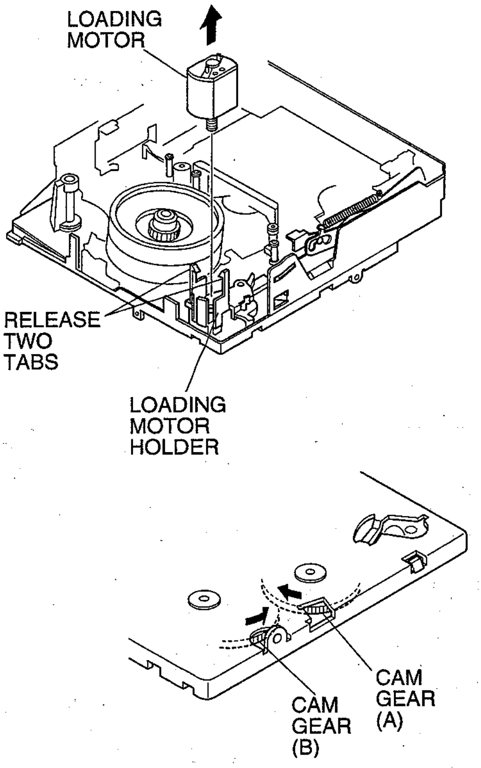

LOADING MOTOR
RELEASE TWO TABS
LOADING MOTOR HOLDER
CAM GEAR (A)
CAM GEAR (B)

Fig. 3-3

Memo

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMANT

Trademark
MS-DOS is a registered trademark of Microsoft Corporation.

Abbreviation
MAP: Digital adjustment program.
DSP: Digital signal processor

1. CONNECTION FOR ADJUSTMENT

1.1 Before Starting Adjustment

(1) Set the date. (If the camera/recorder is left for several minutes with no date set after power is turned on, it will automatically enter the demo mode.)

Notes: 1. Perform the electric circuit adjustments using a personal computer.

2. It is not necessary to remove cases for electric circuit adjustments.
3. The ODC DC cord is a jig which is to be used in the Power Shut Off Level (ODC) Adjustment. For other adjustments, the AC adapter can be used as a power supply.

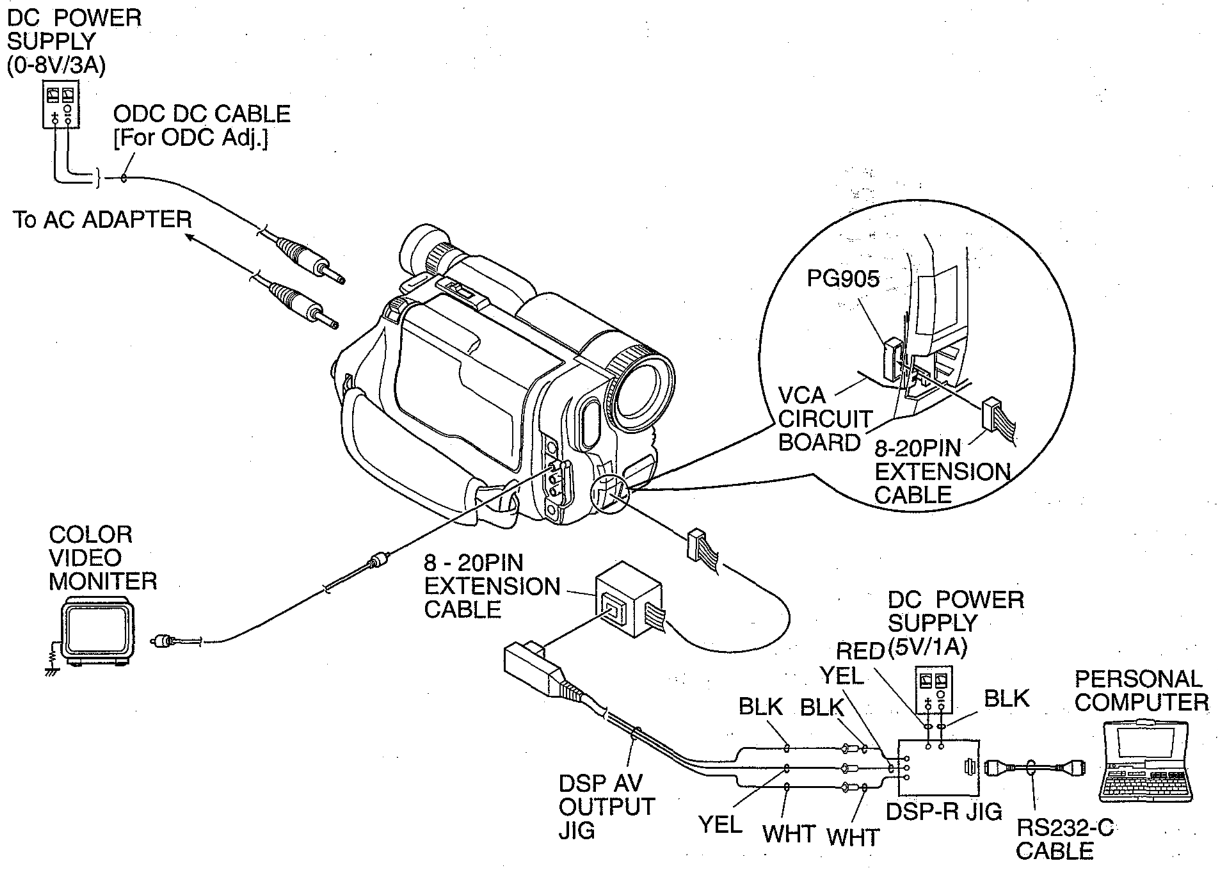

DC POWER SUPPLY (0-8V/3A)
ODC DC CABLE [For ODC Adj.]
To AC ADAPTER
PG905
VCA CIRCUIT BOARD
8-20PIN EXTENSION CABLE
COLOR VIDEO MONITER
8 - 20PIN EXTENSION CABLE
DC POWER SUPPLY (5V/1A)
RED
YEL
BLK
BLK
BLK
PERSONAL COMPUTER
DSP AV OUTPUT JIG
YEL
WHT
WHT
DSP-R JIG
RS232-C CABLE

Fig. 1-1 Connection for adjustment

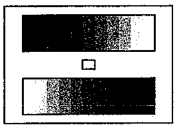
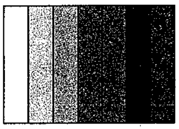
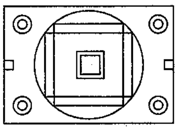
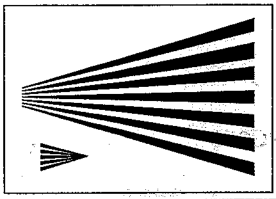
2. CAMERA SECTION ADJUSTMENT

2.1 Test Equipment Necessary for Adjustment

Oscilloscope (dual trace) [& Vectorscope]
Digital Voltmeter (DVM)
Color Video Monitor
Adjustment Floppy Disk
Personal Computer
Personal Computer 9-pin or 25-pin (RS232C) Cable
DSP-R Jig
DSP AV Output Jig
8 - 20 Pin Extension Cable
Light Box (3100 K)
Light Balancing Filter C12
DC Power Supply (DC5V/1A)
AC Adapter or
DC power supply (DC7V/3A) and ODC DC code

2.2 List of Charts for Camera Adjustment

Table 2-1

Gray Scale Chart	Color Bar Chart	Resolution Chart
		
Backfocus Adjustmant Chart 		

2.3 Adjustment Conditions

1. Check that the VCR section has been adjusted correctly before adjusting the camera section.
2. Use a light box with minimum flickering. Control the color temperature of the light box strictly.
3. When using the video out jack to perform adjustment, be sure to terminate the video out jack with 75 ohms.
4. Place the light box approx. 30cm away from the camera (lens surface) when otherwise not specified.
5. Point the camera at the chart to full the video period when otherwise not specified.
6. Use the 10:1 probe of the oscilloscope when otherwise not specified.
7. When "Trigger the oscilloscope internally" is specified, set the time base of the oscilloscope to 10µs/div.

2.4 Preset Positions of Switches and Controls During Adjustment

Note: Some models do not have switches (modes) marked "ß".

CAM/OFF/VIDEO switch	"CAM" position
SUB POWER switch	"STANDBY" position
DC LIGHT switch [ß]	"OFF" position
DATE	Not display mode
TITLE	Not display mode
EFFECT	OFF mode
BLC	OFF mode
MENU	Not display
EIS on the MENU [ß]	OFF mode
PROGRAM AE [ß]	AUTO mode
FOCUS	Autofocus mode
FADE	OFF mode

Caution

1. Since the adjustment program is subject to change for improvements, computer displays may be different from those shown in this manual. In such cases, follow the computer displays for adjustment.
2. The computer displays may be different from those shown in this manual, depending on the destination of models and whether or not certain functions are provided. In such cases, follow the computer displays for adjustment.

2.5 Check After Replacing Major Components in the Camera Section

After replacing major components, perform adjustments, referring to the table below.
The following table shows the minimum adjustments required after major components are replaced.
The table below may not apply when several components are replaced, depending on the symptom of the defect.

Caution: When EEP ROM or the VCA circuit board is replaced, initialize the EEP ROM, referring to "2.6.3 Initial Setting by Model" then perform all the camera section and system control/servo circuits adjustments.

Table 3-2

ITEM No.	NAME OF ADJUSTMENT	NAME OF MAJOR COMPONENTS									
		SE Circuit Board	VCA Circuit Board	IC1001	IC0202	IC1104	IC1105	IC1201	IC1401 IC1402 IC1403	Lens Block	
INITIAL SETTING BY MODEL			●				●				
DIGITAL ADJUSTMENT PROCEDURE											
(1)	Auto Iris Control Adjustment	●	●	●		●	●	●		●	
(2)	White Balance Adjustment	●	●	●			●				
(3)	Chroma Gain Adjustment	●	●	●			●				
AUTOFOCUS ADJUSTMENT PROCEDURE											
(1)	Zoom Trace Adjustment	●	●				●			●	
(2)	AF Noise Level Adjustment	●	●				●			●	
STABILIZER ADJUSTMENT PROCEDURE [Except for TYPE 568, 563 (For ModelEE), 368, 360]		●	●				●		●		
SPOT NOISE ADJUSTMENT PROCEDURE		●	●				●				

2.6 Adjustment Procedure

Notes: 1. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

2. The following describes an example of the instructions of the personal computer and the menu display; they are different depending on the personal computer manufacturer and model. Refer to the instruction manual of personal computer.

3. When the error message appears during adjustment, refer to "4. Error Message". If a key is pressed after an error message appears, the ADJUSTMENT MENU is restored.

2.6.1 Connections for Adjustment

Connect the camera/recorder, DSP jig, personal computer, power supply, etc. as shown in Fig. 1-1.
Check that the camera/recorder is turned on.

2.6.2 How to Start the MAP

(1) Turn the personal computer on and start the MS-DOS system.

Note: Refer to the instruction manual of the personal computer for how to start computer.

(2) Load the adjustment floppy disk in to disk drive A and press **A:** [ENTER]. (Display 2-1)

(3) Press **MAP_IBM** [SPACE] **1** [ENTER]. (Display 2-2)

Note: When you use a personal computer with two serial interface connectors and connect the DSP jig to serial interface connector 2, press MAP_IBM 2.

(4) Select the number accodding to the model. (Display 2-3)
If [ESC] (escape) is pressed, the display before the MAP starts (MS-DOS) is restored.

Notes: 1. If the required model is not found, press the **P** key and select the model from the next screen.
2. If you select number without a model name by mistake, the message shown in "MESSAGE WHEN OPERATED BY MISTAKE" will appear in the computer's display (Display 2-4).
Press any key to return the display to MODEL SELECT dispaly.

(5) Press **Y** key. (Display 2-5)
If **N** key is pressed, the computer's display returns to MODEL SELECT display.

(6) Refer to display 2-6.

2.6.3 Initial Setting by Model

Before Starting Initial Setting

1. This item describes how to initialize the EEP ROM. Be sure to perform this item after replacing EEP ROM or the VCA circuit board.
   When other components are replaced, normally, it is not necessary to initialize the EEP ROM.
2. Be sure to perform the following adjustments after completing the initial setting.
   - 2.6.4 Digital Adjustment Procedure
   - 2.6.5 Autofocus Adjustment Procedure
   - 2.6.6 Stabilizer Adjustment Procedure [Except for TYPE 568, 563 (For Model EE), 368, 360]
   - 2.6.7 Spot Noise Adjustment Procedure
   - 2.7 Color LCD Monitor Adjustment} [Except for TYPE 660, 368, 360]
   - 3.5 System Control/Servo Circuits Adjustment

(1) Start the MAP.

(2) Refer to display 2-6.

(3) Press **A** key.

(4) Refer to display 3-1.

(5) Press **Y** key to start.

Note: Press **N** to return to MAIN MENU display.

(6) Perform adjustment according to the computer display hereafter.
See "4. Error Messages" if an error message appears on the computer display.

Display & Figs

Display 2-1

```
C>A:
A>
```

Display 2-2

```
C>
A>MAP_IBM 1
```

Display 2-3

```
**********************************************
               MODEL SELECT
**********************************************
[1]          xxxxxxx
[2]          xxxxxxx
[3]          xxxxxxx
[4]          xxxxxxx
[5]          xxxxxxx
[P]          NEXT SELECTION
[ESC]        END
   Please select the type of the set.
      Press [1] - [5] or [P] or [ESC]
```

Display 2-4

MESSAGE WHEN OPERATED BY MISTAKE

```
   CAN NOT FIND THE DATA FILE
      **** PRESS ANY KEY ****
```

Display 2-5

```
  Selected model is x x x x x x x
       Are you sure ? (Y/N)
```

Display 2-6

MAIN MENU

```
***********************************************
  MANUAL ADJUSTMENT PROGRAM
***********************************************
 [A]          DATA INITIALIZE
 [B]          ADJUSTMENT
 [C]          VCR ADJUSTMENT
 [D]          AUTO FOCUS
 [E]          STABILIZER
 [F]          SPOT NOISE
 [G]          LCD
 [ESC]        END
    Please select [A] - [G] or [ESC]
```

Display 3-1

```
         « DATA WRITING »
  START TO SEND DATA.   (Y/N)
```

2.6.4 Digital Adjustment Procedure

Before Starting Adjstment

When EEP ROM or the VCA circuit board is replaced, initialize the EEP ROM, referring to "2.6.3 Initial Setting By Model" then perform all the digital adjustments.

(1) Start the MAP.

(2) Refer to display 2-6.

(3) Press **B** key.

(4) Refer to display 4-1.

(5) Select the number of the required adjustment.

Notes: 1. If [ESC] (escape) is pressed, the computer's display returns toMAIN MENU display.
2. To complete adjustment, press the [ESC] (escape) twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

(1) Auto Iris Control Adjustment

Purpose:
To set the iris control data.

Incompleted Phenomenon:
The picture becomes too bright.
The picture becomes too dark.

Condition:
Point the camera at the light box without a chart to full the screen (at wide-angle).

Procedure:

1) Refer to display 4-1.

2) Press **1** key.
Perform adjustment according to the computer display hereafter.
See "4. Error Messages" if an error message appears on the computer display.

3) Refer to display 4-2.

4) Press any key to return to ADJUSTMENT MENU display.

5) Turn the power off for 5 seconds and then on again.

(2) White Balance Adjustment

Purpose:
To set white balance under the color temperature which becomes a reference for the auto white balance circuit.

Incompleted Phenomenon:
Color of the subject is different from that of the picture.
A white subject is not seen as white.

Test Point:
Video Out Jack

Condition:
Attach a C12 filter.
Point at a gray scale chart (at wide-angle).

Procedure:

1) Refer to display 4-1.

2) Press **2** key.

3) Refer to display 4-3.

4) *Model HA:*
Press **0** (ZERO) **A** to input the data.
Model EA:
Press **0** (ZERO) **C** to input the data.
Model HE:
Press **0** (ZERO) **9** to input the data.
Model EE:
Press **0** (ZERO) **D** to input the data.

5) Press [Enter] key, and the display changes as follows.

Display & Figs

Display 2-6

MAIN MENU

```
**********************************************
  MANUAL ADJUSTMENT PROGRAM
**********************************************
  [A]          DATA INITIALIZE
  [B]          ADJUSTMENT
  [C]          VCR ADJUSTMENT
  [D]          AUTO FOCUS
  [E]          STABILIZER
  [F]          SPOT NOISE
  [G]          LCD
  [ESC]        END
     Please select [A] - [G] or [ESC]
```

Display 4-1

ADJUSTMENT MENU

```
*********************************************
              ADJUSTMENT
*********************************************
  [1]    AUTO IRIS CONTROL
  [2]    WHITE BALANCE
  [3]    CHROMA GAIN
  [ESC]  RETURN TO MAIN MENU
     Please select [1]- [3] or [ESC]
```

Display 4-2

```
   ADJUSTMENT FINISHED
     PRESS ANY KEY
```

Display 4-3

```
« WHITE BALANCE ADJUSTMENT »
 INPUT DATA OF OFFSET
                    FOR R-B --> 00
```

Display 4-4

```
« WHITE BALANCE ADJUSTMENT »
 INPUT DATA OF OFFSET
                  FOR Mg-G  --> 00
```

6) Refer to display 4-4.

7) *Model HA:*
   Press **0** (ZERO) **A** to input the data.
   Model EA:
   Press **0** (ZERO) **C** to input the data.
   Model HE:
   Press **0** (ZERO) **B** to input the data.
   Model EE:
   Press **0** (ZERO) **D** to input the data.

8) Press [Enter] key.
   Perform adjustment according to the computer displayhereafter.
   See "4. Error Messages" if an error message appears on the computer display.

(3) Chroma Gain Adjustment (Figs. 2-1, 2-2, 2-3)

Purpose:
To set the color saturation under the reference color temperature.

Incompleted Phenomenon:
Color of the picture is denser than that of the subject.
Color of the picture is lighter than that of the subject.

Equipment/Jig:
Oscilloscope (Vectorscope)

Test Point:
Video Out Jack

Condition:
Attach a C12 filter.
Point at a color bar chart.

Procedure:

1) Refer to display 4-1.

2) Press **3** key.

3) Rerer to dispaly 4-5.

4) *WhenUsing an Oscilloscope:*
   Press the **U** and **D** keys to set the red level to around 470mVp-p.
   Press the [Ctrl] key and hold it down, then press the **U** and **D** keys so the red level is 470mV ± 20mVp-p. (Fig. 2-1)
   When Using a Vectorscope:
   Press the **U** and **D** keys to set the red vector to around 170% of the burst.
   Press the [Ctrl] key and hold it down, then press the **U** and **D** keys so the red vector is 170% ± 5%. (Figs. 2-2, 2-3)

5) Press [Enter] key, and the display changes as 4-6 and 4-7.

6) Press any key to return to ADJUSTMENT MENU display.

Display & Figs

Display 4-1

```
ADJUSTMENT MENU
**********************************************
                 ADJUSTMENT
**********************************************
[1]    AUTO IRIS CONTROL
[2]    WHITE BALANCE
[3]    CHROMA GAIN
[ESC]  RETURN TO MAIN MENU
   Please select [1]- [3] or [ESC]
```

Display 4-4

```
« WHITE BALANCE ADJUSTMENT »
INPUT DATA OF OFFSET
                   FOR Mg-G  --> 00
```

Display 4-5

```
« ADJUSTMENT OF CHROMA GAIN »
        ROUGH ADJUSTMENT
[U]        CHROMA GAIN UP
[D]        CHROMA GAIN DOWN
          FINE ADJUSTMENT
[Ctrl] + [U]CHROMA GAIN UP
[Ctrl] + [D]CHROMA GAIN DOWN
[ENTER]  SAVE & RETURN TO MENU
[ESC]      QUIT
```

Display 4-6

```
« ADJUSTMENT OF CHROMA GAIN »
  DATA WRITING INTO EEPROM.
```

Display 4-7

```
« ADJUSTMENT OF CHROMA GAIN »
    ADJUSTMENT FINISHED.
      PRESS ANY KEY.
```

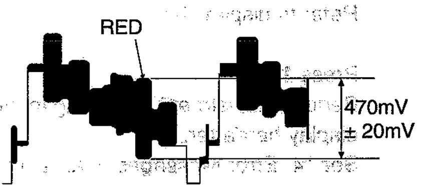


Fig. 2-1

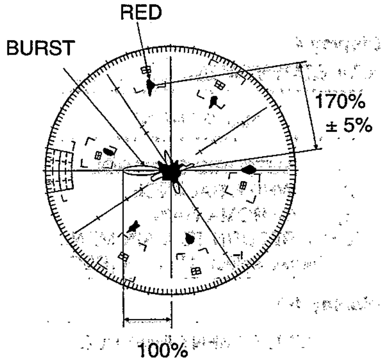


Fig. 2-2 [Model HA, EA]

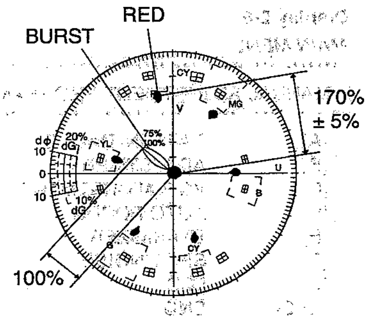


Fig. 2-3 [Model HE, EE]

2.6.5 Autofocus Adjustment Procedure

Before Starting Adjustment

Be sure to perform this adjustment after replacing or initializing the lens block or VCA circuit board (EEPROM).

(1) Start the MAP.

(2) Refer to display 2-6.

(3) Press **D** key.

(4) Refer to display 5-1.

(5) Select the number of the required adjustment.

Note: To complete adjustment, press the [ESC] (escape) twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

(1) Zoom Trace Adjustment

Purpose:
To set the out-of-focus correction level during zooming.

Incompleted Phenomenon:
Focus is lost during zooming.

Equipment/Jig:
Color Video Monitor
Backfocus Chart

Test Point:
Video Out Jack

Condition:
Point at the backfocus chart, 1500 ± 5 mm away from the lens surface.
Light the chart with 200-400 lx.

Caution When Adjustment:

1) Measure the distance between the chart and lens surface precisely.
2) Place the chart as parallel as possible to the lens surface.
3) The backfocus chart should always be at the center of the monitor screen when the zoom is set to the wide-angle and telephoto ends.
4) The zoom trace adjustment procedure is completed within 2 minutes after it is selected.
5) Do not place any obstruction between the lens and chart during adjustment.

Procedure:

1) Refer todisplay 5-1.

2) Press **1** key.
Perform adjustment according to the computer display hereafter.
See "4. Error Messages" if an error message appears on the computer display.

(2) AF Noise Level Adjustment

Purpose:
To set the noise level in the autofocus circuit.

Incompleted Phenomenon:
It takes time until a subject is brought into focus.
Correct focus is not obtained.

Equipment/Jig:
Color Video Monitor

Test Point:
Video Out Jack

Condition:
Set the focus to AUTO.
Point at a light box without a chart inserted at a distance of up to 10cm.

Caution When Adjustment:

1) Place the light box as parallel as possible to the lens surface.
2) The AF noise level adjustment procedure will be completed within thirty seconds after it is selected.

Procedure:

1) Refer todisplay 5-1.

2) Press **2** key.
Perform adjustment according to the computer display hereafter.
See "4. Error Messages" if an error message appears on the computer display.

Display & Figs

Display 2-6

MAIN MENU

```
***********************************************
  MANUAL ADJUSTMENT PROGRAM
***********************************************
 [A]        DATA INITIALIZE
 [B]        ADJUSTMENT
 [C]        VCR ADJUSTMENT
 [D]        AUTO FOCUS
 [E]        STABILIZER
 [F]        SPOT NOISE
 [G]        LCD
 [ESC]      END
    Please select [A] - [G] or [ESC]
```

Display 5-1

AF ADJ. MENU

```
***********************************************
    AUTO FOCUS ADJUSTMENT
***********************************************
[1]    ADJUSTMENT OF ZOOM/
                FOCUS TRACKING
[2]    ADJUSTMENT OF
                AF NOISE LEVEL
[ESC] RETURN TO MENU
      Please select [1], [2] or [ESC]
```

2.6.6 Stabilizer Adjustment Procedure [Except for TYPE 568, 563 (For Model EE), 368, 360]

Before Starting Adjustment

1. Be sure to perform this adjustment after replacing or initializing the SE circuit board and VCA circuit board (EEPROM).
2. This item describes how to rewrite the stabilizer data. The average of the stabilizer data will be written.

(1) Start the MAP.

(2) Refetr to display 2-6.

(3) Press **E** key.

(4) Refer to display 6-1.

(5) Press **Y** key.

(6) Refer to display 6-2.

(7) The stabilizer data is rewritten automatically.

(8) Press any key to return to MAIN MENU display.

Note: To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

2.6.7 Spot Noise Adjustment Procedure

Before Starting Adjustment

1. The spot noise is identified as the fine white noise that appears when the lens cap is attached after the power is turn on.
2. Perform this adjustment only for products with which spot noise occurs. (However, there is no problem even if products free from spot noise are adjusted.)
3. After replacing the CCD image sensor or VCA circuit board (EEPROM), check whether or not spot noise occurs and then proceed with adjustment.

(1) Start the MAP.

(2) Refer to display 2-6.

(3) Cap the lens.

(4) Connect the color video monitor to video out.

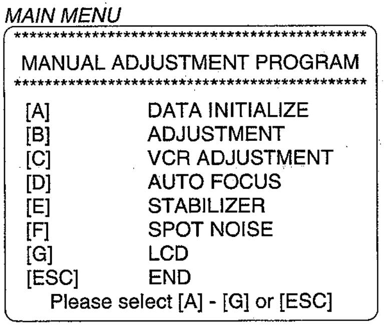
(5) *Except for TYPE 568, 563 (For Model EE), 368, 360:*
Press **F** key.
For TYPE 568, 563 (For Model EE), 368, 360:
Press **E** key.

Perform adjustment according to the computer display hereafter.
See "4. Error Messages" if an error message appears on the computer display.

Note: To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

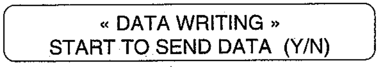
Display & Figs

Display 2-6



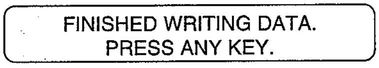
```
MAIN MENU
*********************************************
MANUAL ADJUSTMENT PROGRAM
*********************************************
[A]         DATA INITIALIZE
[B]         ADJUSTMENT
[C]         VCR ADJUSTMENT
[D]         AUTO FOCUS
[E]         STABILIZER
[F]         SPOT NOISE
[G]         LCD
[ESC]       END
  Please select [A] - [G] or [ESC]
```

Display 6-1



```
« DATA WRITING »
START TO SEND DATA  (Y/N)
```

Display 6-2



```
FINISHED WRITING DATA.
PRESS ANY KEY.
```

2.7 Color LCD Monitor Adjustment [Except for TYPE 660, 368, 360]

2.7.1 Adjustment Procedure

Before Starting Adjustment

1. Be sure to perform this adjustment after replacing the LCD unit, components on the LCD circuit board or the VCA circuit board (EEPROM), or initializing the EEPROM.
2. Picture appears on the LCD monitor when the monitor is open. Perform adjustment with the LCD monitor open (SW733 on the CON board set to OFF).

(1) Start the MAP.

(2) Refer to display 2-6.

(3) *Except for TYPE 568, 563 (For Model EE)*
Press **G** key.
For TYPE 568, 563 (For Model EE)
Press **F** key.

(4) Refer to display 7-1.

(5) Select the number of the required adjustment.

Notes: 1. To complete adjustment, press the [ESC] (escape) twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.
2. When an adjustment item is selected from the color LCD adjustment menu, the adjustment mode will be automatically set, and the signal necessary for adjustment will be supplied from the system control µP.

(1) Flicker Adjustment

Purpose:
To minimize flickering on the LCD screen.

Incompleted Phenomenon:
Flickering is present in the picture.

Condition:
Set the CAM/OFF/VIDEO switch to VIDEO position.
Load the alignment tape and it the playback (color bar section).

Procedure:

1) Refer to display 7-1.

2) Press **1** key.

3) Refer to display 7-2.

4) Press the **U** and **D** keys until the picture on the LCD screen is optimal quality.

5) After setting is completed, press the [RETURN (ENTER)] key.

Display & Figs

Display 2-6
MAIN MENU

```
**********************************************
MANUAL ADJUSTMENT PROGRAM
**********************************************
[A]        DATA INITIALIZE
[B]        ADJUSTMENT
[C]        VCR ADJUSTMENT
[D]        AUTO FOCUS
[E]        STABILIZER
[F]        SPOT NOISE
[G]        LCD
[ESC]      END
   Please select [A] - [G] or [ESC]
```

Display 7-1
LCD ADJ. MENU

```
**********************************************
        LCD ADJUSTMENT
**********************************************
[1]        FLICKER
[ESC]      RETURN TO MENU
   Please select [1] or [ESC]
```

Display 7-2

```
**********************************************
              xxxxxxx
**********************************************
[U]        UP
[D]        DOWN
[RETURN] SAVE & RETURN TO MENU
[ESC]      RETURN TO MENU
  Please select [U], [D],
                 [RETURN] or [ESC]
```

3. VCR SECTION ADJUSTMENT

3.1 Test Equipment and Alignment Tapes Necessary for Adjustment

Test Equipment, Jigs etc.

- Digital Voltmeter (DVM)
- Color Video Monitor
- DC Power Supply (DC 0 - 8V/3A)
- DC Power Supply (DC 5V/1A)
- Adjustment Floppy Disk
- Personal Computer
- Personal Computer 9-pin or 25-pin (RS232C) Cable
- DSP-R Jig
- DSP AV Output Jig
- 8 - 20 Pin Extension Cable
- ODC DC Cord

Alignment Tape

- Alignment Tape
- Blank Tape

3.2 Adjustment Condition

1. Check that the camera, LCD monitor and EVF sections has been adjusted correctly before adjusting the VCR section.
2. Connect this unit, a power supply and a color video monitor as shown in Fig. 1-1.
3. Use the 10:1 probe of the oscilloscope when other not specified.
4. When "Record mode" is specified, load a blank tape and set the 8mm video camera/recorder to the record mode by the following procedure.
   1) Set the CAM/OFF/VIDEO switch to the CAM position.
   2) Set the SUB POWER switch to STANDBY position.
   3) Press the REC START/STOP button on the unit (or REC START/STOP button on the remote control).
5. Ground of test equipment: Pre-Amp Shield (GND).

3.3 Preset Positions of Switches and Controls During Adjustment

CAM/OFF/VIDEO switch	"VIDEO" position
TITLE	Not Display mode
PAL CONV. on the MENU	OFF mode

3.4 Check After Replacing Major Components in the VCR Section

After replacing major components, perform checks, referring to the table below.

The following table shows the minimum adjustments required after major components are placed.

The table below may not apply when several components are replaced, depending on the symptom of the defect.

Caution: After replacing the parts, check each adjustment. If you find the items necessary to be adjusted, remove the corresponding laser trimming resistors and replace them with variable resistors for adjustment.

ITEM No.	NAME OF ADJUSTMENT	NAME OF MAJOR COMPONENTS		
		VCA Circuit Board	Cylinder	IC0901
SYSTEM CONTROL/SERVO CIRCUITS ADJUSTMENT				
(1)	Power Shut Off level Adjustment	●		●
(2)	Head Switching Point Adjustment	●	●	●

3.5 System Control/Servo Circuits Adjustment

Before Starting Adjustment

1. System control/servo circuits adjustment also needs a personal computer. Connect the camera/recorder, jigs, power supply, etc. in the same way as in camera section adjustment.
2. Be sure to perform this adjustment after replaceing or initializing the EEP ROM and VCA circuit board.
3. When an error message appears during adjustment, refer to "4. Error Massage".
4. If [ESC] (escape) is pressed, the computer's display returns to MAIN MENU display.
5. To complete adjustment, pres to [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jigs.

(1) Start the MAP.

(2) Refer to display 2-6.

(3) Press **C** key.

(4) Refer to display 8-1.

(5) Select the number of the required adjustment.

(1) Power Shut Off Level (ODC: Over Discharge Control) Adjustment

Purpose:

To set the minimum voltage required to operate the camera/recorder.

Incompleted Phenomenon:

The usable time of the battery becomes short.

The camera/recorder doesn't operate normally.

Equipment/Jig:

DVM

DC Power Supply (0 - 8V)

Blank Tape

ODC DC Cord

Condition:

Connect the camera, LCD monitor and EVF sections.

Supply power (8.0V ± 0.5V) to DC IN via ODC DC cord.

LCD monitor open. (LCD ON)

Cap the lens.

Load the brank tape.

Procedure:

1) Refer to display 8-1.

2) Press **1** key.

3) Refer to display 8-2.

4) Set the voltage of the power supply to 5.8V ± 0.05V.

5) Press any key.

6) Refer to display 8-3.

7) Press any key to return to VCR ADJ. MENU display.

(2) Head Switching Point Adjustment

Note: Be sure to perform this adjustment after replacing the cylinder assembly and VCA circuit board.

Purpose:

To set the switching point of the video heads during playback.

Incompleted Phenomenon:

Vertical jitter occurs.

Switching noise appears across the bottom of the monitor screen.

Equipment/Jig:

Alignment Tape

Condition:

Playback the alignment tape.

Procedure:

1) Refer to display 8-1.

2) Press **2** key.

3) Refer to displays 8-4, 8-5 and 8-6.

4) Press any key to return to VCR ADJ. MENU display.

5) Turn the power off.

Display & Figs

Display 2-6

MAIN MENU

```
************************************************
 MANUAL ADJUSTMENT PROGRAM
************************************************
 [A]          DATA INITIALIZE
 [B]          ADJUSTMENT
 [C]          VCR ADJUSTMENT
 [D]          AUTO FOCUS
 [E]          STABILIZER
 [F]          SPOT NOISE
 [G]          LCD
 [ESC]        END
    Please select [A] - [G] or [ESC]
```

Display 8-1

VCR ADJ. MENU

```
************************************************
            VCR ADJUSTMENT
************************************************
[1]   ADJUSTMENT OF ODC
[2]   ADJUSTMENT OF
              SWITCHING POINT
[ESC] RETURN TO MAIN MENU
      Please select [1], [2] or [ESC]
```

Display 8-2

```
 « SET UP OF ODC
          ADJUSTMENT STARTED »
 PRESET POSITION OF
       'CAMERA/OFF/VCR' SWITCH
           'VCR' POSITION
SET POWER SOURCE AT 5.8 (+/- 0.05)
```

Display 8-3

```
 « SETUP OF ODC
       ADJUSTMENT COMPLETED »
 « ODC ADJUSTMENT STARTED »
« ODC ADJUSTMENT COMPLETED »
        PRESS ANY KEY.
```

Display 8-4

```
 « ADJUSTMENT OF
             SWITCHING POINT »
 PRESET POSITIONS OF
      'CAMERA/OFF/VCR' SWITCH
          'VCR' POSITION
          PRESS ANY KEY
```

Display 8-5

```
 SET UP OF SW POINT
          ADJUSTMENT STARTED.
 SET UP OF SW POINT
        ADJUSTMENT COMPLETED.
SW POINT ADJUSTMENT STARTED.
```

Display 8-6

```
 SW POINT ADJUSTMENT
              DATA CHEACKING.
    FINISHED WRITING DATA.
     ADJUSTMENT FINISHED.
        PRESS ANY KEY.
```

4. ERROR MESSAGE

4.1 Camera Digital Adjustments

ERROR MESSAGE	**COUNTERMEASURE**
ERROR OCCURRED. IRIS TROUBLE PRESS ANY KEY	· Check whether or not power is supplied. · Check the values of the iris drive circuit. · Defective soldering, damage to pattern, etc. in the above circuit. · Check the iris block and replace it if necessary.
ERROR OCCURRED ON dax ADJUSTMENT PRESS ANY KEY	· Check the values in the hall amp circuit. · Defective soldering, damage to pattern, etc. in the above circuit.
D RANGE OVER. ERROR ON dax ADJUSTMENT PRESS ANY KEY.	· Check the values in the hall amp circuit. · Defective soldering, damage to pattern, etc. in theabove circuit.
ERROR OCCURRED ON da0 and da1 ADJUSTMENT PRESS ANY KEY	· Check the values in the hall amp circuit and its peripheral circuits. · Defective soldering, damage to pattern, etc. in the above circuits.
FILE NOT FOUND !!!! PRESS ANY KEY	· The adjustment program (file) cannot be found. · Check the adjustment floppy disk and replace it if necessary.
FILE OPEN ERROR !!!! PRESS ANY KEY	· The adjustment program (file) does not start. · Check the adjustment floppy disk and replace it if necessary.
ERROR OCCURRED ON C DUTY ADJUSTMENT PRESS ANY KEY ERROR OCCURRED ON FDET ADJUSTMENT PRESS ANY KEY	· Check the values of the iris drive circuit. · Defective soldering, damage to pattern, etc. in the above circuit. · Supply power again and re-adjust. · Check the values in the hall amp circuit. · Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED. ZOOM DOES NOT WORK PRESS ANY KEY	· Supply power again and re-adjust.
TOO BRIGHT PRESS ANY KEY	· The subject is too bright. · Move the camera further away from the light box.
TOO DARK PRESS ANY KEY	· The subject is too dark. · Check the light box. · Move the camera closer to the light box.
D RANGE OVER ERROR ON HALL AMP IRIS CANNOT OPEN ANY MORE PRESS ANY KEY	· Supply power again and re-adjust. · The subject is too dark. · Check the light box. · Move the camera closer to the light box. · Check the values in the hall amp circuit. · Defective soldering, damage to pattern, etc. in the above circuit.
STAURATION ERROR. TOO BRIGHT PRESS ANY KEY	· The subject is too bright. · Move the camera further away from the light box.
CAN'T ADJUST WHITE BALANCE PLEASE RETRY PRESS ANY KEY	· The subject is too bright or too dark. · Check the light box. · Move the camera closer to or away from the light box. · Supply power again and re-adjust.

4.2 Autofocus Adjustment

ERROR MESSAGE	COUNTERMEASURE
TIME OUT ERROR ON FOCUS	· Check the conditions of subject. · If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. · Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON ZOOM	· If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. · Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON AF STEP	· Check the conditions of subject. · If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. · Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
AF LIMIT OVER	· Check the conditions of subject. · If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. · Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
AF ERROR	· If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. · Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
TOO DARK	·Insufficient lighting. Check the subject.

4.3 Spot Noise Adjustment

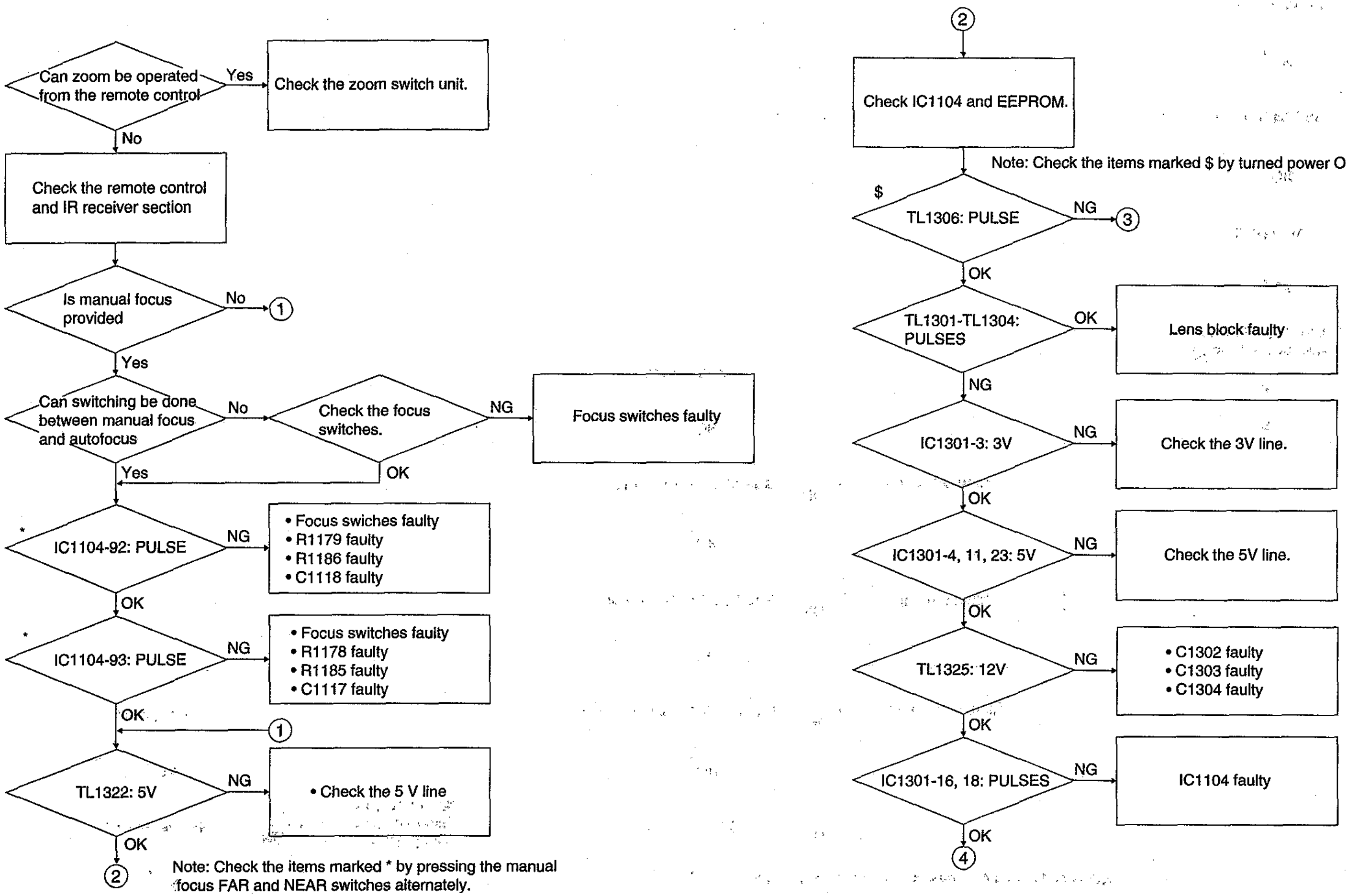
ERROR MESSAGE	COUNTERMEASURE
ERROR!! SPOT NOISE COMPENSATION IS STOPPED BY INITIAL DATA. PLEASE CHECK THE EEPROM. PRESS ANY KEY.	· Spot noise compensation is inhibited by the data in the EEPROM. · Turn the power on again. · Data in the EEPROM is defective. (Initialize it.) · Check the EEPROM,and if necessary,replace it.
ERROR!! THRESHOLD DATA ERROR. PLEASE CHECK THE EEPROM. PRESS ANY KEY.	· Turn the power on again. · Data in the EEPROM is defective. (Initialize it.) · Check the EEPROM,and if necessary,replace it.
ERROR!! THE SPOT NOISE IS TOO MANY. CAN'T COMPENSATE ANY MORE. PRESS ANY KEY.	· The amount of spot noise that can be compensated reaches the limit. · Turn the power on again. · Check the CCD image sensor,and if necessary,replace it.

4.4 VCR Adjustment

ERROR MESSAGE	**COUNTERMEASURE**
ERROR: SWP_TEST>DAT FILE NOT FOUND!	· The adjustment program cannot be found. · Check the adjustment floppy disk and replace it if necessary.
ERROR: INVALID MODEL PRESS ANY KEY	· A wrong model has been selected. · The adjustment program cannot be found. · Check the adjustment floppy disk and replace it if necessary.
THIS MODEL NEED NOT BE ADJUSTED PRESS ANY KEY	· A wrong model has been selected. · A product that needs analog adjustment is connected.
ADJUSTMENT INCOMPLETED PRESS ANY KEY	· The value set by adjustment defective. · Re-adjust. · Check cylinder. · Check the alignment tape. · Check whether or not the usual operation is done correctly.
RETRY ADJUSTING. PRESS ANY KEY	· Supply power again and re-adjust.
CAMERA IS NOT READY	· Check whether or not power is supplied.
ERROR OCCURRED CAN'T PLAY BACK PRESS ANY KEY	· No playback video. · Check the playback signal.
ERROR OCCURRED NO V.SYNC FOUND PRESS ANY KEY	· Vertical sync loss. · Check the vertical sync signal.
INVALID MODEL PRESS ANY KEY	· A wrong model has been selected. · The adjustment program cannot be found. · Check the adjustment floppy disk and replace it if necessary.
ERROR OCCURRED CAN'T RECORD PRESS ANY KEY	· No video recording. · Check the recording signal.

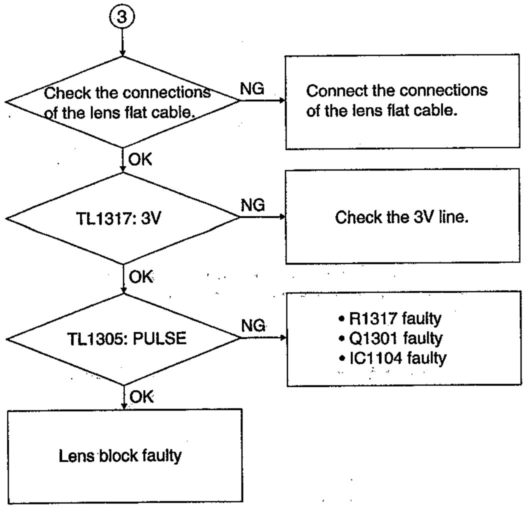
Memo

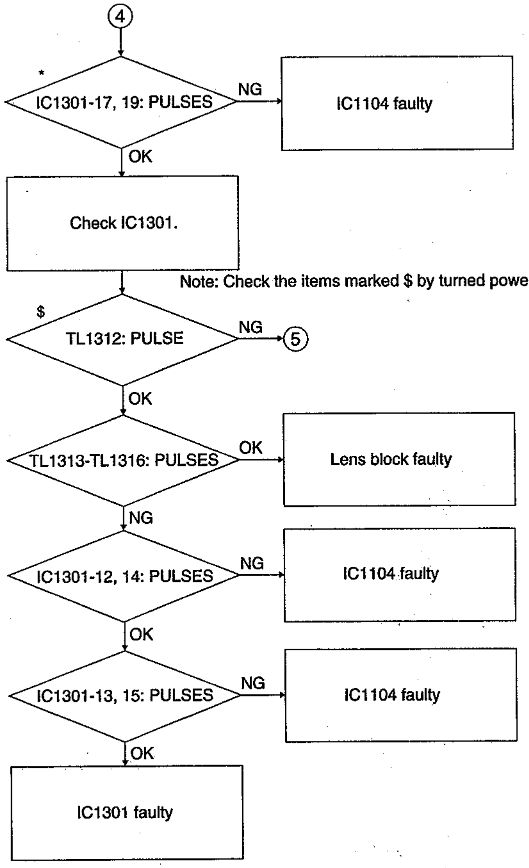
(1) NO ZOOM AND FOCUS OPERATION


Can zoom be operated from the remote control
Yes
Check the zoom switch unit.
No
Check the remote control and IR receiver section
Is manual focus provided
No
①
Yes
Can switching be done between manual focus and autofocus
No
Check the focus switches.
NG
Focus switches faulty
OK
Yes
*
IC1104-92: PULSE
NG
• Focus swiches faulty
• R1179 faulty
• R1186 faulty
• C1118 faulty
OK
*
IC1104-93: PULSE
NG
• Focus switches faulty
• R1178 faulty
• R1185 faulty
• C1117 faulty
OK
①
TL1322: 5V
NG
• Check the 5 V line
OK
②
②
Check IC1104 and EEPROM.
$
TL1306: PULSE
NG
③
OK
TL1301-TL1304: PULSES
OK
Lens block faulty
NG
IC1301-3: 3V
NG
Check the 3V line.
OK
IC1301-4, 11, 23: 5V
NG
Check the 5V line.
OK
TL1325: 12V
NG
• C1302 faulty
• C1303 faulty
• C1304 faulty
OK
IC1301-16, 18: PULSES
NG
IC1104 faulty
OK
④

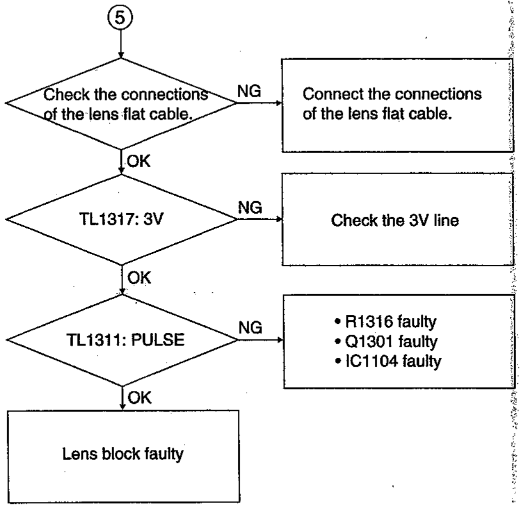
Note: Check the items marked $ by turned power ON.

Note: Check the items marked * by pressing the manual focus FAR and NEAR switches alternately.

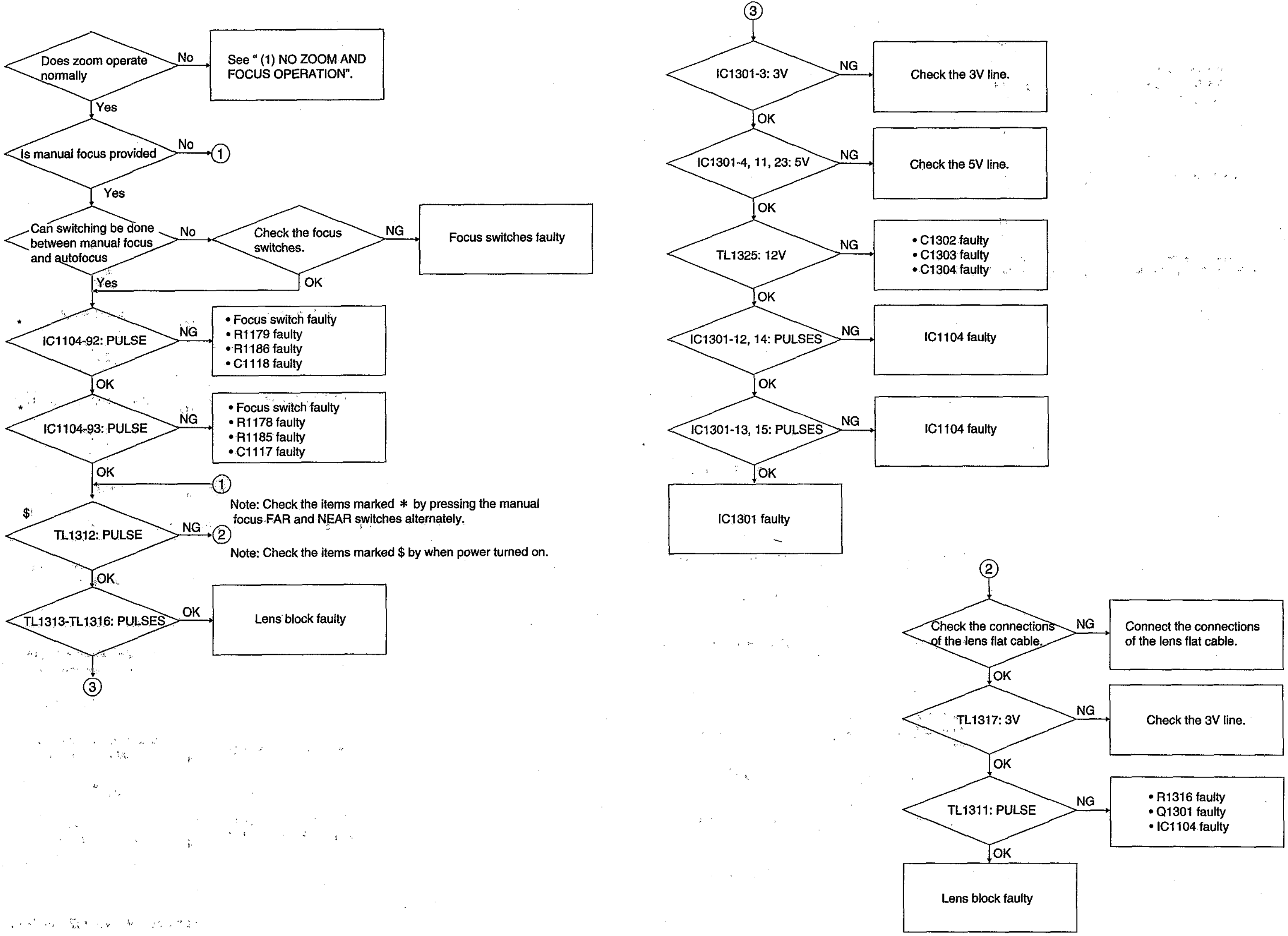

③
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1317: 3V
NG
Check the 3V line.
OK
TL1305: PULSE
NG
• R1317 faulty
• Q1301 faulty
• IC1104 faulty
OK
Lens block faulty


④
*
IC1301-17, 19: PULSES
NG
IC1104 faulty
OK
Check IC1301.
$
TL1312: PULSE
NG
⑤
OK
TL1313-TL1316: PULSES
OK
Lens block faulty
NG
IC1301-12, 14: PULSES
NG
IC1104 faulty
OK
IC1301-13, 15: PULSES
NG
IC1104 faulty
OK
IC1301 faulty

Note: Check the items marked $ by turned power ON.


⑤
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1317: 3V
NG
Check the 3V line
OK
TL1311: PULSE
NG
• R1316 faulty
• Q1301 faulty
• IC1104 faulty
OK
Lens block faulty

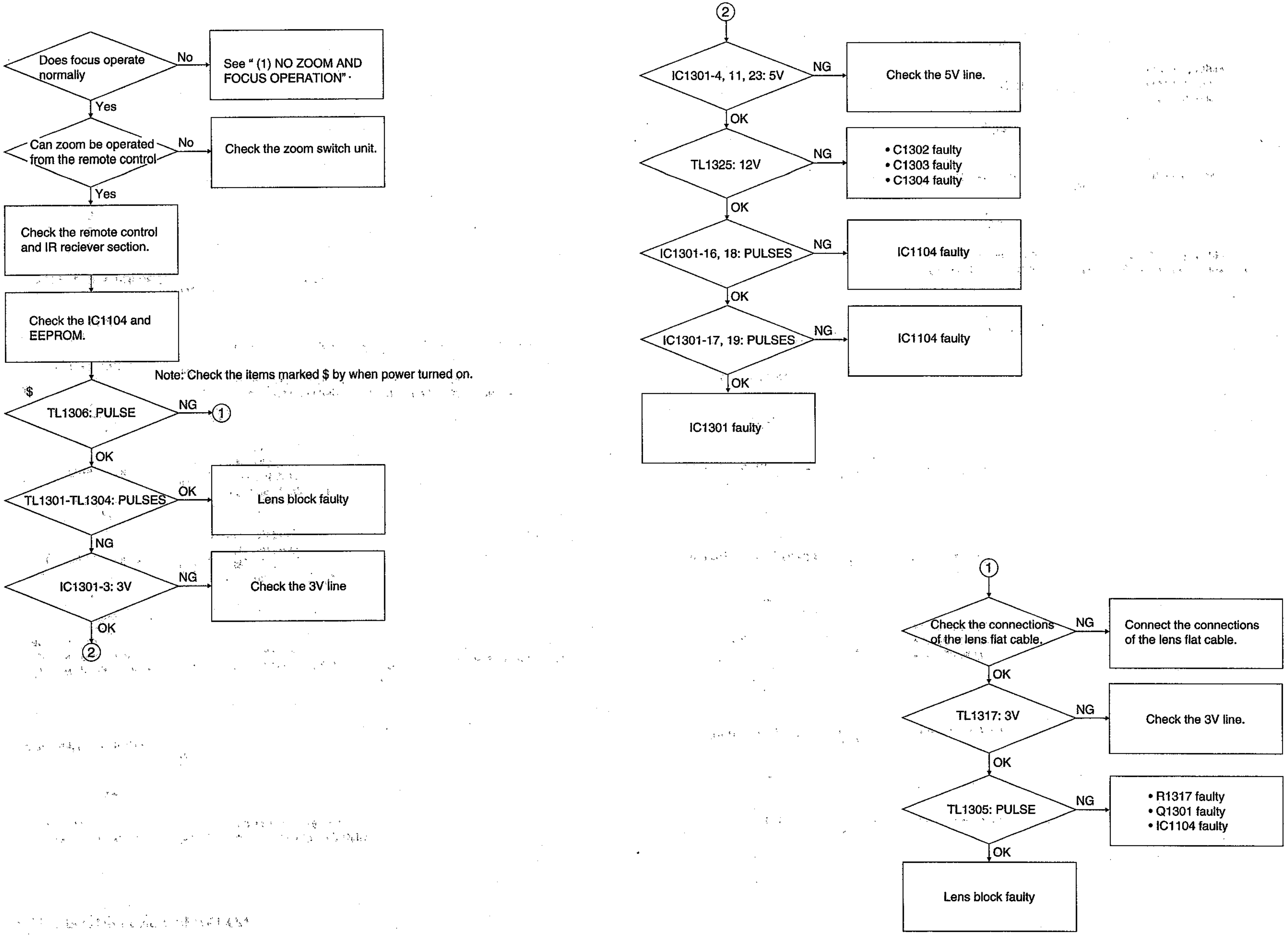
(2) NO FOCUS LENS OPERATION


Does zoom operate normally
No
See " (1) NO ZOOM AND FOCUS OPERATION".
Yes
Is manual focus provided
No
①
Yes
Can switching be done between manual focus and autofocus
No
Check the focus switches.
NG
Focus switches faulty
OK
Yes
*
IC1104-92: PULSE
NG
• Focus switch faulty
• R1179 faulty
• R1186 faulty
• C1118 faulty
OK
*
IC1104-93: PULSE
NG
• Focus switch faulty
• R1178 faulty
• R1185 faulty
• C1117 faulty
OK
①
$
TL1312: PULSE
NG
②
OK
TL1313-TL1316: PULSES
OK
Lens block faulty
③
③
IC1301-3: 3V
NG
Check the 3V line.
OK
IC1301-4, 11, 23: 5V
NG
Check the 5V line.
OK
TL1325: 12V
NG
• C1302 faulty
• C1303 faulty
• C1304 faulty
OK
IC1301-12, 14: PULSES
NG
IC1104 faulty
OK
IC1301-13, 15: PULSES
NG
IC1104 faulty
OK
IC1301 faulty
②
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1317: 3V
NG
Check the 3V line.
OK
TL1311: PULSE
NG
• R1316 faulty
• Q1301 faulty
• IC1104 faulty
OK
Lens block faulty

Note: Check the items marked * by pressing the manual focus FAR and NEAR switches alternately.

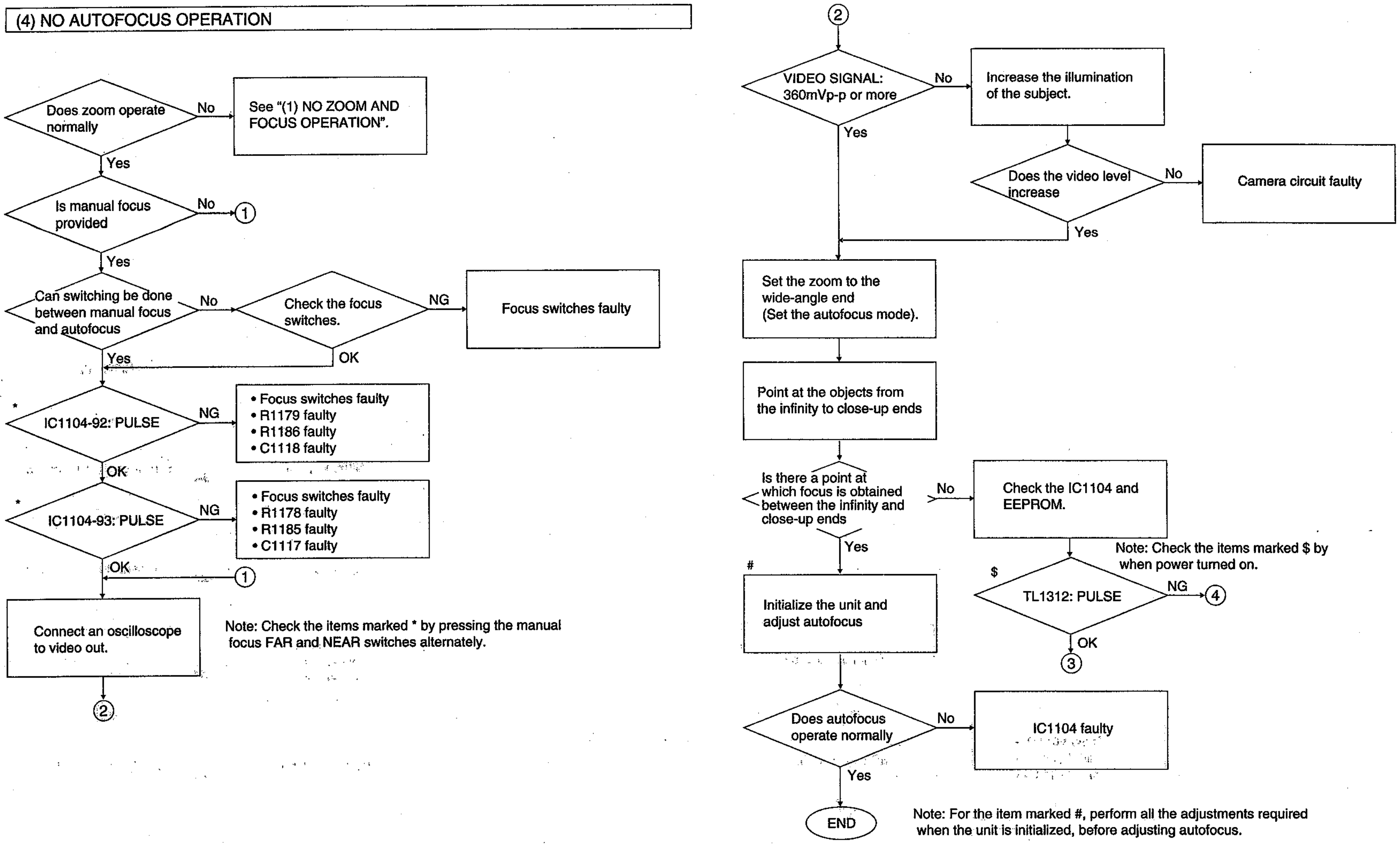
Note: Check the items marked $ by when power turned on.

(3) NO ZOOM OPERATION


Does focus operate normally
No
See " (1) NO ZOOM AND FOCUS OPERATION".
Yes
Can zoom be operated from the remote control
No
Check the zoom switch unit.
Yes
Check the remote control and IR reciever section.
Check the IC1104 and EEPROM.
$
TL1306: PULSE
NG
①
OK
TL1301-TL1304: PULSES
OK
Lens block faulty
NG
IC1301-3: 3V
NG
Check the 3V line
OK
②
②
IC1301-4, 11, 23: 5V
NG
Check the 5V line.
OK
TL1325: 12V
NG
• C1302 faulty
• C1303 faulty
• C1304 faulty
OK
IC1301-16, 18: PULSES
NG
IC1104 faulty
OK
IC1301-17, 19: PULSES
NG
IC1104 faulty
OK
IC1301 faulty
①
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1317: 3V
NG
Check the 3V line.
OK
TL1305: PULSE
NG
• R1317 faulty
• Q1301 faulty
• IC1104 faulty
OK
Lens block faulty

Note: Check the items marked $ by when power turned on.

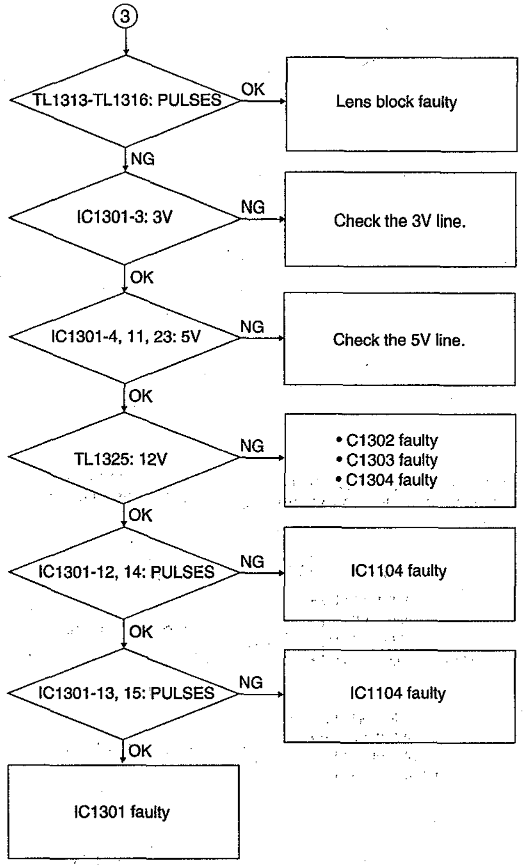
(4) NO AUTOFOCUS OPERATION

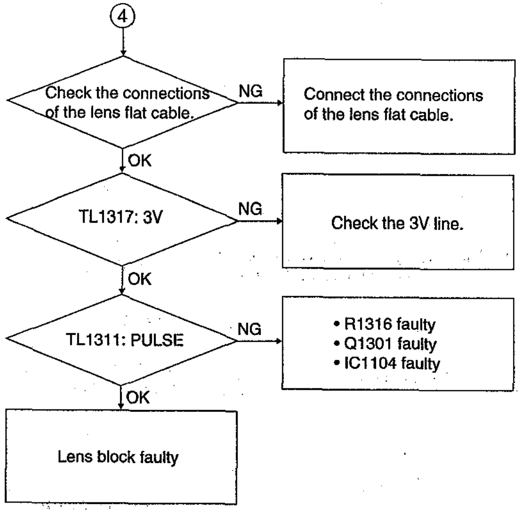

Does zoom operate normally
No
See "(1) NO ZOOM AND FOCUS OPERATION".
Yes
Is manual focus provided
No
①
Yes
Can switching be done between manual focus and autofocus
No
Check the focus switches.
NG
Focus switches faulty
OK
Yes
*
IC1104-92: PULSE
NG
• Focus switches faulty
• R1179 faulty
• R1186 faulty
• C1118 faulty
OK
*
IC1104-93: PULSE
NG
• Focus switches faulty
• R1178 faulty
• R1185 faulty
• C1117 faulty
OK
①
Connect an oscilloscope to video out.
②
②
VIDEO SIGNAL: 360mVp-p or more
No
Increase the illumination of the subject.
Does the video level increase
No
Camera circuit faulty
Yes
Yes
Set the zoom to the wide-angle end (Set the autofocus mode).
Point at the objects from the infinity to close-up ends
Is there a point at which focus is obtained between the infinity and close-up ends
No
Check the IC1104 and EEPROM.
$
TL1312: PULSE
NG
④
OK
③
Yes
#
Initialize the unit and adjust autofocus
Does autofocus operate normally
No
IC1104 faulty
Yes
END

Note: Check the items marked * by pressing the manual focus FAR and NEAR switches alternately.

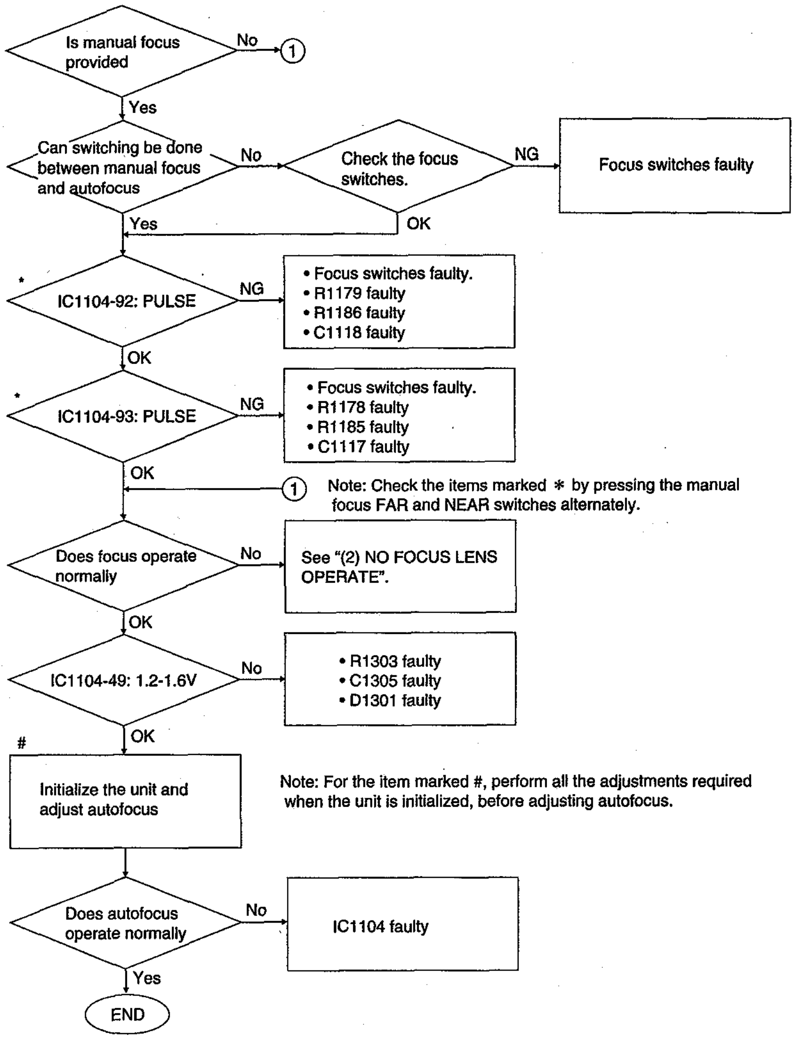
Note: Check the items marked $ by when power turned on.

Note: For the item marked #, perform all the adjustments required when the unit is initialized, before adjusting autofocus.


③
TL1313-TL1316: PULSES
OK
Lens block faulty
NG
IC1301-3: 3V
NG
Check the 3V line.
OK
IC1301-4, 11, 23: 5V
NG
Check the 5V line.
OK
TL1325: 12V
NG
• C1302 faulty
• C1303 faulty
• C1304 faulty
OK
IC1301-12, 14: PULSES
NG
IC1104 faulty
OK
IC1301-13, 15: PULSES
NG
IC1104 faulty
OK
IC1301 faulty


④
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1317: 3V
NG
Check the 3V line.
OK
TL1311: PULSE
NG
• R1316 faulty
• Q1301 faulty
• IC1104 faulty
OK
Lens block faulty

(5) SUBJECT IS GREATLY OUT-OF-FOCUS WHEN ZOOMED


Is manual focus provided
No
①
Yes
Can switching be done between manual focus and autofocus
No
Check the focus switches.
NG
Focus switches faulty
OK
Yes
*
IC1104-92: PULSE
NG
• Focus switches faulty.
• R1179 faulty
• R1186 faulty
• C1118 faulty
OK
*
IC1104-93: PULSE
NG
• Focus switches faulty.
• R1178 faulty
• R1185 faulty
• C1117 faulty
OK
①
Does focus operate normally
No
See "(2) NO FOCUS LENS OPERATE".
OK
IC1104-49: 1.2-1.6V
No
• R1303 faulty
• C1305 faulty
• D1301 faulty
OK
#
Initialize the unit and adjust autofocus
Does autofocus operate normally
No
IC1104 faulty
Yes
END

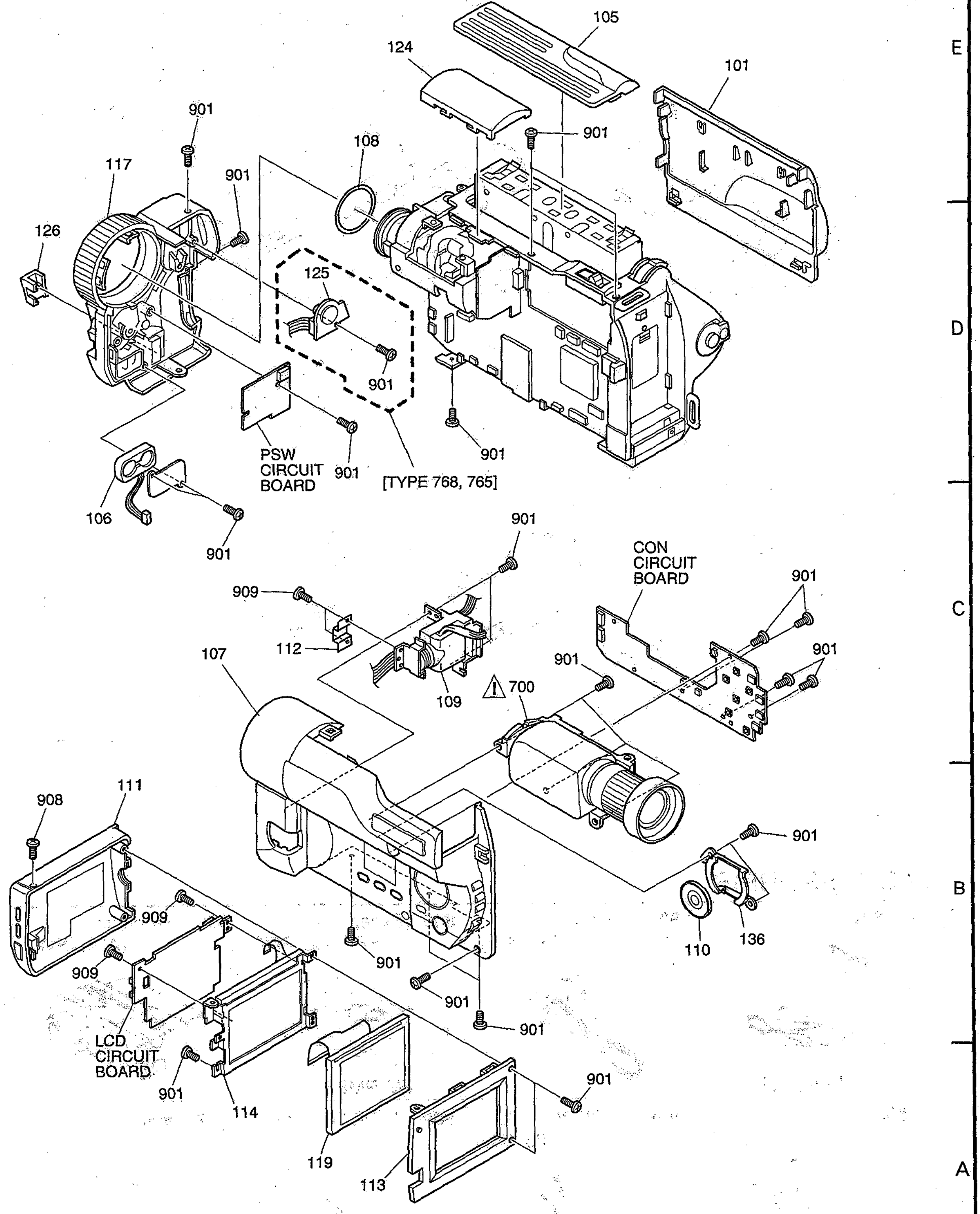
Note: Check the items marked ∗ by pressing the manual focus FAR and NEAR switches alternately.

Note: For the item marked #, perform all the adjustments required when the unit is initialized, before adjusting autofocus.

Memo

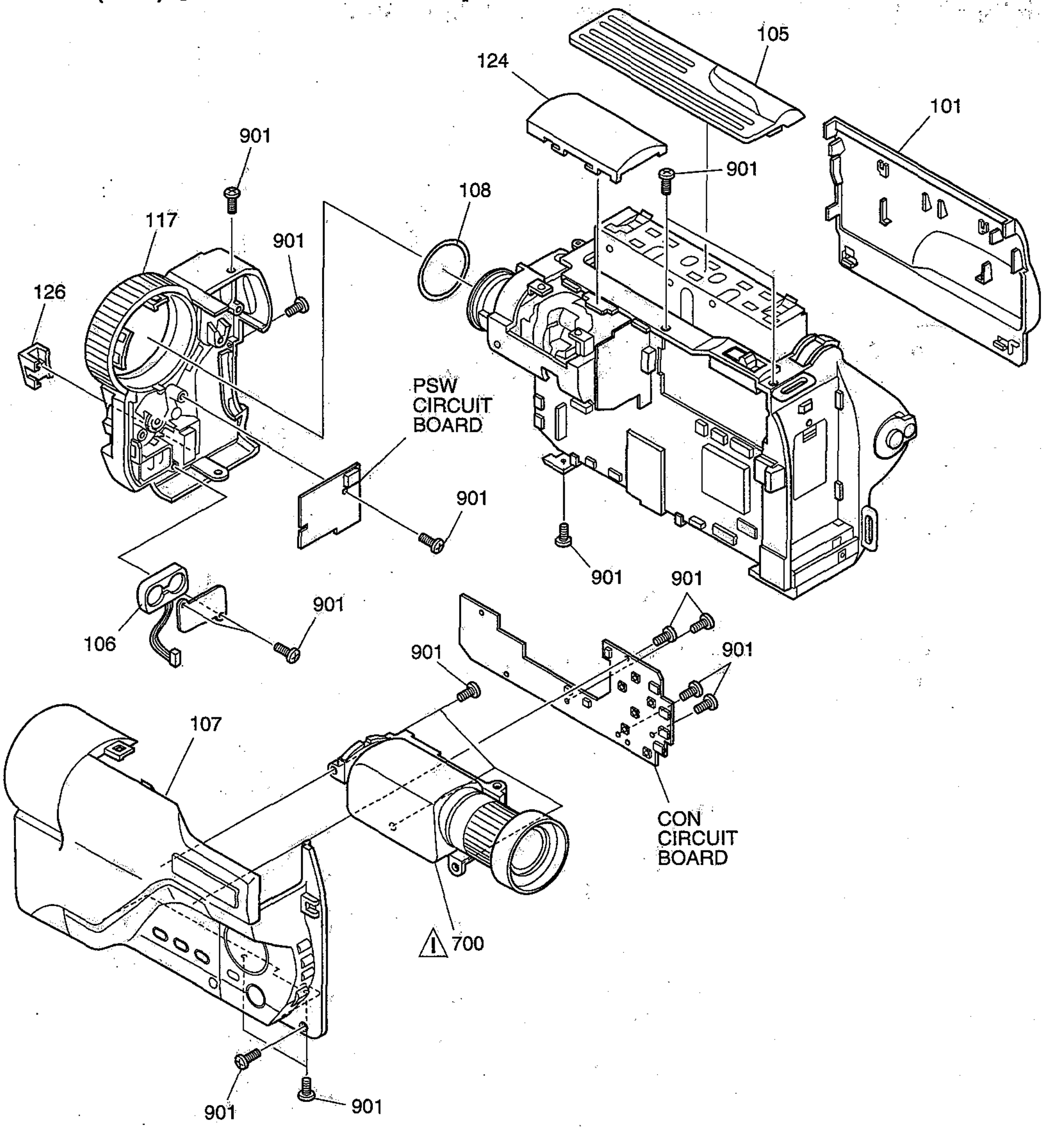
CHAPTER 4 | EXPLODED VIEW

CABINET (1-1) [TYPE 768, 765, 665, 568, 565, 563]

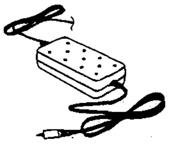
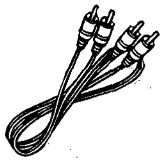
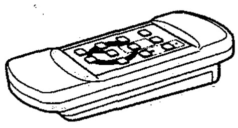
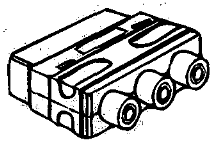
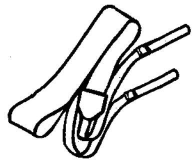
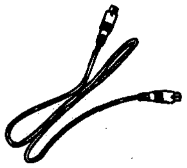
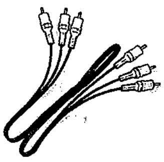
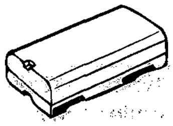

105
124
101
901
108
901
117
901
126
125
901
901
PSW CIRCUIT BOARD
901
[TYPE 768, 765]
106
901
901
CON CIRCUIT BOARD
901
909
112
107
901
109
700
901
111
908
901
909
909
LCD CIRCUIT BOARD
901
114
901
901
901
901
110
136
119
113
E
D
C
B
A
1
2
3
4

NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.

CABINET (1-2) [TYPE 660, 368, 360]

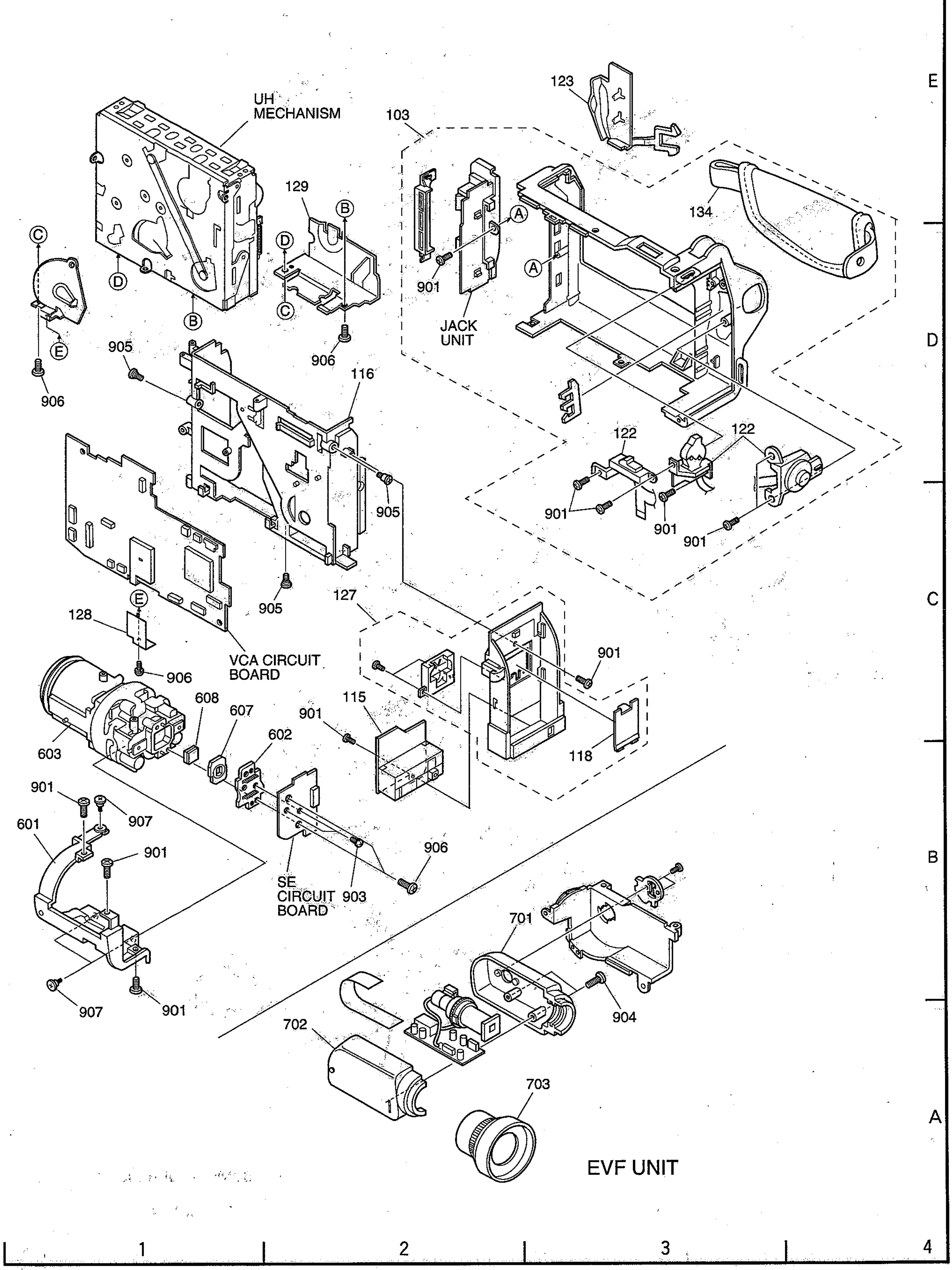

105
124
101
901
108
117
901
126
901
PSW CIRCUIT BOARD
901
901
901
106
901
901
901
107
CON CIRCUIT BOARD
⚠700
901
901
E
D
C
B
A

ACCESSOREIS

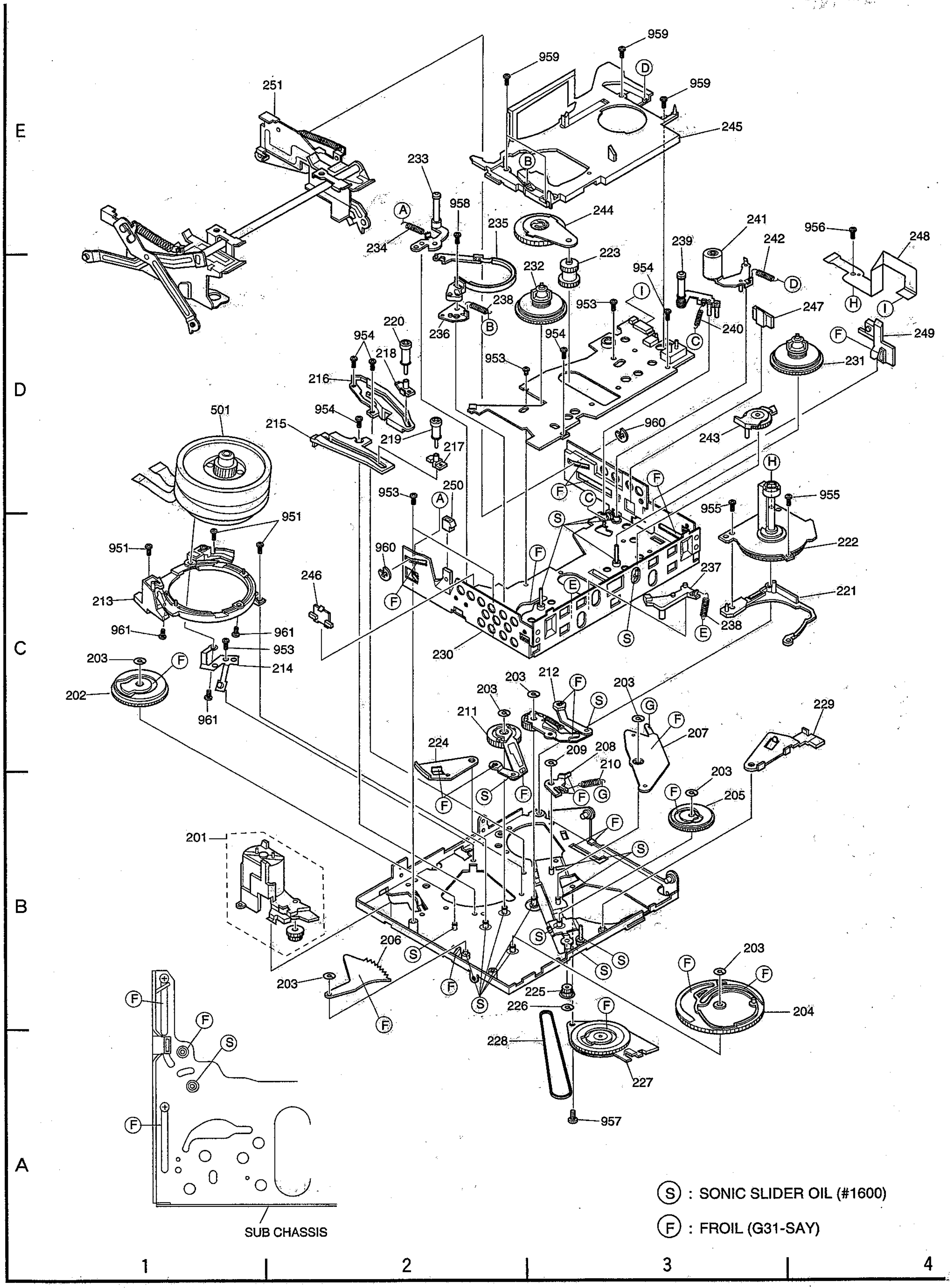
⚠ **802**  VM-ACE5E	**804** [Except for TYPE 765, 665] 	**805** [Except for TYPE 568, 368]  VM-RME611A	**806** [Except for (AU), (SW)] 
807 	**808** [TYPE 768, 765, 665, 660] 	**809** [TYPE 765, 665] 	⚠ **Battery**  VM-BPL13

1 2 3 4

CABINET (2)


UH MECHANISM
A
A
A
B
B
C
C
D
D
E
E
JACK UNIT
VCA CIRCUIT BOARD
SE CIRCUIT BOARD
EVF UNIT
E
D
C
B
A

UH MECHANISM


E
D
C
B
A
1
2
3
4
959
959
959
251
245
233
958
234
235
244
241
956
248
242
239
223
232
954
953
240
247
249
231
238
236
220
954
218
216
953
954
501
215
954
219
217
960
243
953
250
955
955
222
951
951
960
246
213
237
221
238
230
961
961
953
214
203
202
961
203
212
203
211
203
229
207
224
209
208
210
203
205
201
206
203
225
226
228
227
957
203
204
A
B
C
D
E
F
G
H
I
S
SUB CHASSIS

Ⓢ : SONIC SLIDER OIL (#1600)

Ⓕ : FROIL (G31-SAY)

CHAPTER 5 REPLACEMENT PARTS LIST

1. MECHANICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		MECHANISM SECTION
101	QD18891	LID, CASSETTE
103	QD19882	CASE, SIDE(R) [TYPE 768]
103	QD18621	CASE, SIDE(R) [TYPE 765, 665]
103	QD19868	CASE, SIDE(R) [TYPE 660]
103	QD19884	CASE, SIDE(R) [TYPE 568]
103	QD18623	CASE, SIDE(R) [TYPE 565]
103	QD19883	CASE, SIDE(R) [TYPE 563]
103	QD19864	CASE, SIDE(R) [TYPE 368, 360]
105	QD18911	COVER, TOP
106	GH10351	MICROPHONE [TYPE 765, 665]
106	GH10352	MICROPHONE [EXCEPT FOR TYPE 765, 665]
107	QD18651	CASE, SIDE(L) [TYPE 768, 563]
107	QD18654	CASE, SIDE(L) [TYPE 765, 665, 565]
107	QD18657	CASE, SIDE(L) [TYPE 660]
107	QD18653	CASE, SIDE(L) [TYPE 568]
107	QD18659	CASE, SIDE(L) [TYPE 368]
107	QD18658	CASE, SIDE(L) [TYPE 360]
108	NX11244	RING(O)
109	NX19223	FLUCLUM ASSY [EXCEPT FOR TYPE 660, 368, 360]
110	GK10252	SPEAKER [EXCEPT FOR TYPE 660, 368, 360]
111	QD19232	CASE, LCD(U) [TYPE 768]
111	QD19231	CASE, LCD(U) [TYPE 765]
111	QD19233	CASE, LCD(U) [TYPE 665]
111	QD19236	CASE, LCD(U) [TYPE 568]
111	QD19234	CASE, LCD(U) [TYPE 565]
111	QD19235	CASE, LCD(U) [TYPE 563]
112	MN15232	SPACER [EXCEPT FOR TYPE 660, 368, 360]
113	QD18871	CASE, LCD(B) [EXCEPT FOR TYPE 660, 368, 360]
114	DT10351	LIGHT, BACK [EXCEPT FOR TYPE 660, 368, 360]
115	FH10652	TERMINAL UNIT
116	NT11721	FRAME, MECHA
117	QD18952	CASE, FRONT [TYPE 768]
117	QD18951	CASE, FRONT [TYPE 765]
117	QD18953	CASE, FRONT [TYPE 665]
117	QD18954	CASE, FRONT [EXCEPT FOR TYPE 768, 765, 665]
118	QX13981	COVER, BATTERY
119	DB10721	DISPLAY, LIQUID CRYSTAL [EXCEPT FOR TYPE 660, 368, 360]
122	FH10661	SWITCH(TW/PW)
123	QX14041	COVER, JACK
124	PH19911	COVER, LENS
125	DP10331	LAMP [TYPE 768, 765]
126	QX14081	COVER
127	QD18701	COVER, REAR
128	MD12832	SHIELD PLATE
129	MD12622	SHIELD, MECHA
134	PV10241	STRAP, HAND
136	NA17111	BRACKET [EXCEPT FOR TYPE 660, 368, 360]
201	KX19871	HOLDER, LOADING MOTOR
202	KX21991	GEAR, CAM(A)
203	7787731	WASHER
204	KX22121	GEAR, CAM(B)
205	KX20271	GEAR, CAM(C)
206	KX19802	ARM, DRIVE
207	KX19812	LEVER, DRIVE
208	KX19821	PLATE, PRESSURE
209	7787735	WASHER
210	KL12652	SPRING
211	KX19705	LINK(L)
212	KX19657	LINK(R)
213	KX21591	BASE, CYLINDER ASSY
214	FU10311	BRUSH
215	KX20551	GUIDE RAIL(I)
216	KX20561	GUIDE RAIL(O)
217	KX20573	BASE, GUIDE ROLLER(I)
218	KX20582	BASE, GUIDE ROLLER(O)
219	KF13072	GUIDE(I)
220	KF13112	ROLLER
221	KX20293	BASE, CM
222	GP10665	MOTOR, CAPSTAN
223	KF12911	GEAR, CENTER
224	KX21601	PLATE
225	KF12901	GEAR, PULLY
226	7787733	WASHER
227	KX22012	SWITCH, MODE
228	KK10331	BELT, TIMING
229	KX21411	ARM, R
230	UE13524	CHASSIS, SUB
231	KH10353	REEL DISK, TAKE-UP
232	KH10363	REEL, DISK SUPPLY
233	KX20303	ARM, TENSION
234	KL12661	SPRING, TENSION
235	KX20202	BAND, TENSION
236	KX19841	BASE, B
237	KX19851	BRAKE
238	KL12671	SPRING
239	KX20495	ARM, OHD
240	KL12681	SPRING
241	KX20354	ARM, PR
242	KL12691	SPRING
243	KG10281	GEAR, BRAKE
244	KG10302	IDLER ASSY
245	KX20483	COVER, IDLER
246	KX20461	GUIDE, LIGHT(L)
247	KX20472	GUIDE, LIGHT(R)
248	EK11132	FLEXIBLE, MECHA
249	KX20242	HOLDER, EJECT
250	KX19791	LID OPENER
251	KX19609	CASSETTE HOLDER ASSY
501	HX10256	CYLINDER ASSY(CY-53LR) [TYPE 568, 565, 563, 368, 360]
501	HX10258	CYLINDER ASSY(CY-53L5-F) [TYPE 768, 765, 665, 660]
601	NT11701	FRAME, LENS
602	UE14255	CCD IMAGE SENSOR ASSY [EXCEPT FOR TYPE 765, 665, 660]
602	UE14256	CCD IMAGE SENSOR ASSY [TYPE 765, 665, 660]
603	KQ10752	LENS ASSY
607	NX11252	RUBBER
608	DT10312	CRYSTAL [TYPE 765, 665, 660]
608	DT10314	CRYSTAL [EXCEPT FOR TYPE 765, 665, 660]
⚠700	UX10662	EVF AS
701	QD19201	CASE, EVF(R)
702	QD19211	CASE, EVF(L)
703	QD19771	PIECE, EYE
901	7775946	SCREW (2X6)
903	7775945	SCREW(2X5)
904	8619003	SCREW 1.7X5
905	7773891	SCREW
906	8650103	SCREW(2X3)
907	MJ10221	SCREW
908	7775964	SCREW(2X4) [EXCEPT FOR TYPE 660, 368, 360]
909	MK11701	SCREW(2X4S) [EXCEPT FOR TYPE 660, 368, 360]
951	8700268	SCREW(1.7X3)
953	7775911	SCREW(1.4X1.6)
954	7775913	SCREW (1.4X2.0)
955	8712970	SCREW(1.4X4)

2. ELECTRICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
956	8712974	SCREW(1.4X6)
957	8712968	SCREW(1.4X3P)
958	MK11551	SCREW(1.7X3.0)
959	8714026	SCREW (1.4X3.5)
960	7778394	E RING
961	8711105	SCREW(2X5)
		ACCESSARIES
⚠802	TS15053	ADAPTOR,AC(VM-ACE5E)
⚠802	TS15054	ADAPTER,AC(VM-ACE5E(UK))
⚠802	TS15055	ADAPTOR,AC(VM-ACE5E(AU))
804	EW10943	CORD [EXCEPT FOR TYPE 765,665]
805	HL11231	REMOTE HAMD SET[EXCEPT FOR TYPE 568,368]
806	TS12981	AV PLUG ADAPTER[EXCEPT FOR (AU),(SW)]
807	TS14621	STRAP,SHOULDER
808	EW12152	CORD,S(Y/C)[TYPE 768,765,665,660]
809	EW12143	CORD,3PIN [TYPE 765,665]

SYMBOL NO	P-NO	DESCRIPTION
		CAMERA & VCR SECTION
C0001	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0004	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0005	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0101	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0102	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0104	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0105	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0106	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0107	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0108	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0109	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0110	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0111	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0112	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0113	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0114	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0115	0806186	ELECTROLYTIC 220UF 6.3V
C0116	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0117	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0118	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0119	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0120	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0121	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0122	0893117	CERAMIC CHIP 22PF+-5% 50V
C0123	0893133	CERAMIC CHIP 330PF+-5% 50V
C0124	0893112	CERAMIC CHIP 9.0PF+-0.5% 50V
C0125	0893122	CERAMIC CHIP 47PF+-5% 50V
C0126	0893114	CERAMIC CHIP 12PF+-5% 50V
C0128	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0129	0893132	CERAMIC CHIP 270PF+-5% 50V
C0130	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0132	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0133	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0134	0893111	CERAMIC CHIP 8PF+-0.5% 50V
C0135	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C0136	0893126	CERAMIC CHIP 100PF+-5% 50V
C0137	0893123	CERAMIC CHIP 56PF+-5% 50V
C0139	0893121	CERAMIC CHIP 39PF+-5% 50V
C0140	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0150	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0151	0893122	CERAMIC CHIP 47PF+-5% 50V
C0152	0893119	CERAMIC CHIP 33PF+-5% 50V
C0153	0893121	CERAMIC CHIP 39PF+-5% 50V
C0154	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0155	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0156	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0201	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0202	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0203	AA01101R	CERAMIC CAPACITOR 10UF+-20% 10V
C0205	AD10488R	CHIP CAPACITOR 100UF+-20% 4V
C0208	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0209	0893109	CERAMIC CHIP 7.0PF 50V
C0210	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0212	0893109	CERAMIC CHIP 7.0PF 50V
C0215	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0217	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0218	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C0219	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0220	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0222	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0223	0806167	ELECTROLYTIC 47UF 4V
C0224	0893193	CERAMIC CHIP 0.01UF+-10% 25V

SYMBOL NO	P-NO	DESCRIPTION
C0225	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0226	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0227	0893116	CERAMIC CHIP 18PF+-5% 50V
C0230	0893129	CERAMIC CHIP 180PF+-5% 50V
C0231	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0232	0893123	CERAMIC CHIP 56PF+-5% 50V
C0233	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0234	0893104	CERAMIC CHIP 2.0PF 50V [TYPE 768,765,665,660]
C0234	0893121	CERAMIC CHIP 39PF+-5% 50V [TYPE 568,565,563,368,360]
C0235	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0236	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0237	0893119	CERAMIC CHIP 33PF+-5% 50V
C0239	0893111	CERAMIC CHIP 8PF+-0.5% 50V
C0240	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0241	0893205	CERAMIC CHIP 560PF+-10% 50V
C0242	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0243	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0245	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0246	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0247	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0248	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0252	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0253	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0260	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0261	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0262	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0263	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0265	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0266	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C0267	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0268	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0269	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0270	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0271	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0272	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0273	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0274	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0275	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0277	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0278	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0279	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0280	0893117	CERAMIC CHIP 22PF+-5% 50V
C0281	0893117	CERAMIC CHIP 22PF+-5% 50V
C0282	0893117	CERAMIC CHIP 22PF+-5% 50V
C0285	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0290	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0301	0806133	ELECTROLYTIC 10UF 6.3V
C0302	0806178	ELECTROLYTIC 220UF 4V
C0303	0806178	ELECTROLYTIC 220UF 4V
C0304	0806133	ELECTROLYTIC 10UF 6.3V
C0305	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0306	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0307	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0308	0806168	ELECTROLYTIC 47UF 6.3V
C0309	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0311	0806027	ELECTROLYTIC 4.7UF 4V
C0312	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0315	AA00934R	CERAMIC CAPACITOR 2.2UF+-10% 10V
C0350	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0352	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0353	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0354	AA00335R	CHIP CERAMIC 1.0UF+80-20% 25V
C0355	AA01101R	CERAMIC CAPACITOR 10UF+-20% 10V
C0356	0893093	CERAMIC CHIP 2.2UF+80-20% 16V
C0357	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0358	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0360	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0361	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0362	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0363	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0364	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0365	AA00698R	CERAMIC CHIP 2.2UF+-10% 16V
C0401L	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0401R	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0405L	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0405R	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0406L	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0406R	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0407M	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0408L	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0408R	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0409M	0893099	CERAMIC CHIP 0.47UF+-10% 16V
C0410M	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0411L	0893213	CERAMIC CHIP 2200PF+-10% 50V
C0411R	0893213	CERAMIC CHIP 2200PF+-10% 50V
C0412L	0893211	CERAMIC CHIP 1500PF+-10% 50V
C0412R	0893211	CERAMIC CHIP 1500PF+-10% 50V
C0413M	AD10266R	ELECTROLYTIC 22UF 4V
C0414	0806162	ELECTROLYTIC 33UF 4V [TYPE 768,660,568,565,563,368,360]
C0414	0806167	ELECTROLYTIC 47UF 4V[TYPE 765,665]
C0414R	0806167	ELECTROLYTIC 47UF 4V
C0415M	0806027	ELECTROLYTIC 4.7UF 4V
C0416L	AA00934R	CERAMIC CAPACITOR 2.2UF+-10% 10V
C0416R	AA00934R	CERAMIC CAPACITOR 2.2UF+-10% 10V
C0417L	0806027	ELECTROLYTIC 4.7UF 4V
C0417R	0806027	ELECTROLYTIC 4.7UF 4V
C0418M	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0419L	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0419R	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0420M	0806027	ELECTROLYTIC 4.7UF 4V
C0421L	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0421R	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0422M	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0423L	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0423R	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0424M	0806133	ELECTROLYTIC 10UF 6V
C0425L	0806027	ELECTROLYTIC 4.7UF 4V
C0425R	0806027	ELECTROLYTIC 4.7UF 4V
C0426M	0806027	ELECTROLYTIC 4.7UF 4V
C0427S	AA00934R	CERAMIC CAPACITOR 2.2UF+-10% 10V
C0428M	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0429M	0893191	CERAMIC CHIP 6800PF+-10% 25V
C0430S	0806027	ELECTROLYTIC 4.7UF 4V
C0431M	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0431S	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0432M	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0433L	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0433R	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0435M	0893215	CERAMIC CHIP 3300PF+-10% 50V
C0436S	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0437S	0806133	ELECTROLYTIC 10UF 6V
C0438M	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0439M	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0440M	0893213	CERAMIC CHIP 2200PF+-10% 50V
C0441M	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C0442M	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0443M	0806168	ELECTROLYTIC 47UF 6.3V

SYMBOL NO	P-NO	DESCRIPTION
C0444M	0806133	ELECTROLYTIC 10UF 6V
C0446M	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C0447M	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0448L	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0448R	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0449M	0806027	ELECTROLYTIC 4.7UF 4V
C0451M	0806156	ELECTROLYTIC 22UF 4V
C0452S	0806133	ELECTROLYTIC 10UF 6.3V
C0453S	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0454M	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0455M	0893099	CERAMIC CHIP 0.47UF+-10% 16V
C0457	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0458	0806168	ELECTROLYTIC 47UF 6.3V
C0459	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0460	0806133	ELECTROLYTIC 10UF 6V
C0461M	0806167	ELECTROLYTIC 47UF 4V
C0463	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0464S	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0465	0806174	ELECTROLYTIC 100UF 6.3V
C0466	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0471	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0471R	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0472	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0472R	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0473L	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0473R	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0474L	AA01111R	CERAMIC CHIP 1UF 6.3V
C0474R	AA01111R	CERAMIC CHIP 1UF 6.3V
C0475L	AA01111R	CERAMIC CHIP 1UF 6.3V
C0475R	AA01111R	CERAMIC CHIP 1UF 6.3V
C0476L	0893191	CERAMIC CHIP 6800PF+-10% 25V
C0476R	0893191	CERAMIC CHIP 6800PF+-10% 25V
C0477L	AA01111R	CERAMIC CHIP 1UF 6.3V
C0477R	AA01111R	CERAMIC CHIP 1UF 6.3V
C0478L	0893216	CERAMIC CHIP 3900PF+-10% 50V
C0478R	0893216	CERAMIC CHIP 3900PF+-10% 50V
C0479S	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0480S	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0481	AA00934R	CERAMIC CAPACITOR 2.2UF+-10% 10V
C0482L	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0482R	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0483	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0483R	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0484L	0893099	CERAMIC CHIP 0.47UF+-10% 16V
C0484R	0893099	CERAMIC CHIP 0.47UF+-10% 16V
C0489	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0489R	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0501	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0502	0893119	CERAMIC CHIP 33PF+-5% 50V
C0503	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0504	0893119	CERAMIC CHIP 33PF+-5% 50V
C0505	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0507	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0508	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0509	0893126	CERAMIC CHIP 100PF+-5% 50V
C0510	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0511	0893183	CHIP CERAMIC 0.018PF+-10% 16V
C0513	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C0514	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0516	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0517	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0518	0893129	CERAMIC CHIP 180PF+-5% 50V
C0519	0893133	CERAMIC CHIP 330PF+-5% 50V
C0520	0893129	CERAMIC CHIP 180PF+-5% 50V
C0521	0893133	CERAMIC CHIP 330PF+-5% 50V
C0522	0893129	CERAMIC CHIP 180PF+-5% 50V
C0523	0893215	CERAMIC CHIP 3300PF+-10% 50V
C0524	0893133	CERAMIC CHIP 330PF+-5% 50V
C0525	0893129	CERAMIC CHIP 180PF+-5% 50V
C0527	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0528	AA00412R	CERAMIC CHIP 10UF+-80-20% 16V
C0529	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0530	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0534	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0535	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0538	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0540	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0541	AA00335R	CHIP CERAMIC 1.0UF+80-20% 25V
C0542	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0543	AA00335R	CHIP CERAMIC 1.0UF+80-20% 25V
C0544	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0545	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0546	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0547	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0550	AA00412R	CERAMIC CHIP 10UF+-80-20% 16V
C0551	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0552	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0559	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0562	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0577	0893058	CERAMIC CHIP 0.33UF+80-20% 16V
C0578	0806174	ELECTROLYTIC 100UF 6.3V
C0582	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C0584	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0585	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0586	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0588	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0589	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0590	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0591	AA00335R	CHIP CERAMIC 1.0UF+80-20% 25V
C0592	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0593	AA00412R	CERAMIC CHIP 10UF+-80-20% 16V
C0594	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0595	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0596	AA00335R	CHIP CERAMIC 1.0UF+80-20% 25V
C0597	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0598	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0631	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0632	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0633	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0635	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0636	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0637	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0638	0893219	CERAMIC CHIP 0.0068UF+-10% 50V
C0640	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0641	AA01134R	CERAMIC CAPACITOR 0.33UF+-10% 6.3V
C0642	0806133	ELECTROLYTIC 10UF 6.3V
C0643	0806133	ELECTROLYTIC 10UF 6.3V
C0644	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0645	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0647	AA01132R	CERAMIC CAPACITOR 0.22UF+-10% 6.3V
C0648	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0649	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0650	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0651	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0652	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0655	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0656	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0657	AA01136R	CERAMIC CAPACITOR 0.47UF+-10% 6.3V
C0658	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0659	0893179	CERAMIC CHIP 0.1UF+-10% 16V

SYMBOL NO	P-NO	DESCRIPTION
C0660	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0671	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C0672	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C0673	0893213	CERAMIC CHIP 2200PF+-10% 50V
C0691	0893198	CERAMIC CHIP 0.027UF+-10% 25V
C0692	0893245	CERAMIC CAPACITOR 0.015UF+-10% 50V
C0693	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0694	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0695	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0696	0893219	CERAMIC CHIP 0.0068UF+-10% 50V
C0701	0806168	ELECTROLYTIC 47UF 6.3V
C0703	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0731	0806174	ELECTROLYTIC 100UF 6.3V
C0736	0806174	ELECTROLYTIC 100UF 6.3V
C0737	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0757	AA00751R	CERAMIC CHIP 10UF+-10% 6.3V
C0904	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0905	0806173	ELECTROLYTIC 100UF 4V
C0906	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0907	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0908	0806167	ELECTROLYTIC 47UF 4V
C0909	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0910	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0911	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C0912	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C0913	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0914	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0915	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0916	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0917	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0918	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0919	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0920	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0921	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0922	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0923	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0924	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0925	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0926	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0927	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C0928	0893117	CERAMIC CHIP 22PF+-5% 50V
C0929	0893117	CERAMIC CHIP 22PF+-5% 50V
C0930	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C0942	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1001	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1003	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1004	0893211	CERAMIC CHIP 1500PF+-10% 50V
C1005	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1006	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1007	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1008	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1009	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1011	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1012	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1111	0893208	CERAMIC CHIP 1000PF+-10% 50V
C1112	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1113	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1114	0893208	CERAMIC CHIP 1000PF+-10% 50V
C1115	0893208	CERAMIC CHIP 1000PF+-10% 50V
C1116	0893208	CERAMIC CHIP 1000PF+-10% 50V
C1117	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1118	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1155	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1159	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1161	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1162	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1163	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1164	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1165	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1167	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1168	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1169	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1170	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1201	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1202	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1203	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1204	0893132	CERAMIC CHIP 270PF+-5% 50V
C1205	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1206	0893178	CERAMIC CAPACITOR 0.082UF+-10% 16V
C1207	0893069	CERAMIC CHIP 0.22UF+80-20% 25V
C1208	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1209	0893133	CERAMIC CHIP 330PF+-5% 50V
C1210	0893133	CERAMIC CHIP 330PF+-5% 50V
C1211	0893133	CERAMIC CHIP 330PF+-5% 50V
C1212	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1213	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1301	0806186	ELECTROLYTIC 220UF 6.3V
C1302	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1305	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1306	AA01101R	CERAMIC CAPACITOR 1UF+-20% 10V
C1311	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1403	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1404	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1405	0806156	ELECTROLYTIC 22UF 4V
C1406	0806156	ELECTROLYTIC 22UF 4V
C1407	0893194	CERAMIC CHIP 0.012UF+-10% 25V
C1408	0893194	CERAMIC CHIP 0.012UF+-10% 25V
C1409	0893194	CERAMIC CHIP 0.012UF+-10% 25V
C1410	0893194	CERAMIC CHIP 0.012UF+-10% 25V
C1411	AA00373R	CERAMIC CAPACITOR 4.7UF+-10% 10V
C1412	AA00373R	CERAMIC CAPACITOR 4.7UF+-10% 10V
C1413	0893214	CERAMIC CHIP 2700PF+-10% 50V
C1414	0893214	CERAMIC CHIP 2700PF+-10% 50V
C1415	0893232	CERAMIC CHIP 0.1UF+80-20% 25V
C1417	0806156	ELECTROLYTIC 22UF 4V
C5314	0893099	CERAMIC CHIP 0.47UF+-10% 16V
C5319	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C5320	AD10274R	ELECTROLYTIC 6.8UF 20V
C5501	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C5502	0893093	CERAMIC CHIP 2.2UF+80-20% 16V
C5503	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C5504	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C5505	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C5507	AA00373R	CERAMIC CAPACITOR 4.7UF+-10% 10V
C5509	0893116	CERAMIC CHIP 18PF+-5% 50V
C5510	0893118	CERAMIC CHIP 27PF+-5% 50V
C5511	AD10276R	ELECTROLYTIC 33UF 10V
C5512	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C5513	AF10115R	CHIP CAPASITOR 0.018UF+-5% 50V
C5524	AA10647R	CERAMIC CAPACITOR 12PF+-5% 2KV
R0001	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0002	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0003	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0006	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0007	0103978	CHIP RESISTOR 3.3OHM+-5% 1/8W
R0008	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0009	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0010	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0011	AQ01007R	CHIP RESISTOR 1KOHM+-0.5% 1/16W
R0012	AQ01021R	CHIP RESISTOR 10KOHM+-0.5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION
R0013	AQ01024R	CHIP RESISTOR 18KOHM+-0.5% 1/16W
R0014	AQ01007R	CHIP RESISTOR 1KOHM+-0.5% 1/16W
R0017	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0018	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0020	AQ10405R	CHIP RESISTOR 0.10OHM 1/4W
R0024	AQ01031R	CHIP RESISTOR 56KOHM+-0.5% 1/16W
R0025	0105217	CHIP RESISTOR 150KOHM+-0.5% 1/16W
R0101	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0102	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0103	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0104	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0105	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0106	0790007	CHIP RESISTOR 5.6 OHM+-5% 1/16W
R0107	0790007	CHIP RESISTOR 5.6 OHM+-5% 1/16W
R0108	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0109	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0110	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R0111	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0112	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0113	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0114	0790076	CHIP RESISTOR 820KOHM+-5% 1/16W
R0115	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0116	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0118	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0119	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0120	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0121	0790056	CHIP RESISTOR 27KOHM+-5% 1/16W
R0122	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0123	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0124	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0125	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0126	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0127	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0128	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0129	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0130	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0131	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0132	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0133	0790029	CHIP RESISTOR 270 OHM+-5% 1/16W
R0140	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0141	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0144	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0145	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0146	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0147	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0148	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0149	0790027	CHIP RESISTOR 180OHM+-5% 1/16W
R0150	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0151	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0152	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0153	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0154	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0156	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0157	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0158	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0159	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0160	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0161	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0163	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0164	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0165	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0166	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0170	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0171	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0172	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0173	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0174	0790008	CHIP RESISTOR 6.8 OHM+-5% 1/16W
R0175	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0176	0790029	CHIP RESISTOR 270 OHM+-5% 1/16W [TYPE 660,568,565,563,368,360]
R0176	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W [TYPE 768,765,665]
R0177	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0178	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0179	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0202	BM00141R	FILTER
R0204	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0206	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0208	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0209	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0210	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0213	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0214	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0215	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R0216	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0217	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0219	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0220	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0221	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0222	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0225	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0226	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0227	AQ00221R	CHIP RESISTOR 10KOHM+-1% 1/16W
R0228	AQ00227R	CHIP RESISTOR 18KOHM+-1% 1/16W
R0229	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0230	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0231	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0232	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0233	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0234	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0235	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0236	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0237	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0238	AQ00227R	CHIP RESISTOR 18KOHM+-1% 1/16W
R0239	AQ00221R	CHIP RESISTOR 10KOHM+-1% 1/16W
R0248	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0249	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0250	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0254	BM00135R	COIL
R0255	BM00141R	FILTER
R0256	BM00135R	COIL
R0258	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0259	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0260	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0266	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0267	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0268	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0274	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0275	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0276	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0277	0790019	CHIP RESISTOR 47 OHM+-5% 1/16W
R0278	BM00137R	FILTER
R0279	BM00137R	FILTER
R0283	AQ00231R	CHIP RESISTOR 24KOHM+-1% 1/16W
R0285	0790012	CHIP RESISTOR 12 OHM+-5% 1/16
R0286	0790012	CHIP RESISTOR 12 OHM+-5% 1/16
R0288	0790056	CHIP RESISTOR 27KOHM+-5% 1/16W
R0289	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0290	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0291	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION
		[TYPE 568,565,563,368,360]
R0291	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
		[TYPE 768,765,665]
R0301	0790022	CHIP RESISTOR 68 OHM+-5% 1/16W
R0302	0790022	CHIP RESISTOR 68 OHM+-5% 1/16W
R0304	0790022	CHIP RESISTOR 68 OHM+-5% 1/16W
R0306	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0311	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
		[TYPE 768,765,665]
R0311	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
		[TYPE 565,563]
R0328	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0351	AQ00181R	CHIP RESISTOR 330 OHM+-1% 1/16W
R0353	AQ00181R	CHIP RESISTOR 330 OHM+-1% 1/16W
R0355	AQ00181R	CHIP RESISTOR 330 OHM+-1% 1/16W
R0356	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0357	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0358	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0359	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0360	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0361	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0362	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0366	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0401M	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0404M	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0405L	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0405R	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0406M	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0407M	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0409	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0414M	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0415M	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0416M	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0419M	0790069	CHIP RESISTOR 270KOHM+-5% 1/16W
R0426	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0431S	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0432S	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0434M	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0435S	0104121	CHIP RESISTOR 27KOHM+-1% 1/10W
R0436M	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0437M	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0440M	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0442	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0443M	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0444M	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0445M	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0446S	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0447M	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0447S	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0448S	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0449	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0450	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0451M	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0452M	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0453M	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0454M	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0456	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0457L	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0457R	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0458	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0458	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0458R	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0461	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0462	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0463S	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0464S	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0468S	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0470M	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0471	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0471R	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0472	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0472R	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0473	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0473	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0473R	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0474	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
		[TYPE 765,665]
R0474	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
		[TYPE 768,660,568,565,563,368,360]
R0474R	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0475L	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0475R	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0476L	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0476R	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0477L	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0477R	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0478L	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0478R	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0479L	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0479R	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0480L	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0480R	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0481L	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0481R	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0482L	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0482R	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0483L	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0483R	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0484S	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0485S	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0486	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0493L	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0493R	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0494	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0494R	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0495	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
		[TYPE 768,565,563]
R0495	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
		[TYPE 765,665]
R0495R	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0499	0790025	CHIP RESISTOR 120 OHM+-5% 1/16W
R0499R	0790025	CHIP RESISTOR 120 OHM+-5% 1/16W
R0501	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0502	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0504	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0505	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0506	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0507	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0508	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0510	AQ00238R	CHIP RESISTOR 47KOHM+-1% 1/16W
R0511	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0512	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0513	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0514	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0516	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0517	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0518	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0519	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0522	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0525	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION
R0529	AQ00211R	CHIP RESISTOR 4.3KOHM+-1% 1/16W
R0531	AQ01004R	CHIP RESISTOR 560 OHM+-0.5% 1/16W
R0532	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0533	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0534	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0539	AQ01021R	CHIP RESISTOR 10KOHM+-0.5% 1/16W
R0540	AQ01005R	CHIP RESISTOR 680 OHM+-0.5% 1/16W
R0541	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0545	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0546	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0549	0790076	CHIP RESISTOR 820KOHM+-5% 1/16W
R0550	AQ10274R	CHIP RESISTOR 46.4KOHM+-0.5% 1/16W
R0551	AQ01005R	CHIP RESISTOR 680 OHM+-0.5% 1/16W
R0552	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0553	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0554	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0556	AQ01005R	CHIP RESISTOR 680 OHM+-0.5% 1/16W
R0557	AQ01004R	CHIP RESISTOR 560 OHM+-0.5% 1/16W
R0558	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0561	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0562	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0566	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0567	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0568	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0569	AQ00213R	CHIP RESISTOR 5.1KOHM+-1% 1/16W
R0583	0790023	CHIP RESISTOR 82 OHM+-5% 1/16W
R0585	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R0597	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0598	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0599	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0640	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0641	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0642	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0643	0105815	CHIP RESISTOR 0.47 OHM+-10% 1/4W
R0644	0105815	CHIP RESISTOR 0.47 OHM+-10% 1/4W
R0662	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0664	0790002	CHIP RESISTOR 2.2 OHM+-5% 1/16W
R0665	0790002	CHIP RESISTOR 2.2 OHM+-5% 1/16W
R0666	0790002	CHIP RESISTOR 2.2 OHM+-5% 1/16W
R0667	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0668	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0671	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0672	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0681	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0682	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0691	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0692	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0693	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0694	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0695	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0696	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0701	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0702	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0734	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0761	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0762	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0763	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0764	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0765	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0766	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0767	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0771	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0772	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0773	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0774	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0775	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0776	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0777	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0778	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0901	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0902	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0903	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R0904	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0905	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0906	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0907	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0908	0105217	CHIP RESISTOR 150KOHM+-0.5% 1/16W
R0909	AQ01031R	CHIP RESISTOR 56KOHM+-0.5% 1/16W
R0912	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0913	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0914	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0915	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0916	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0917	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0918	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0919	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0920	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0921	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0922	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0923	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0924	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0925	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0926	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0928	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0929	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0930	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0931	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0932	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0933	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0934	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0935	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0936	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0937	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0941	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0942	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0943	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0944	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0945	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0946	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0948	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0949	AQ00221R	CHIP RESISTOR 10KOHM+-1% 1/16W
R0950	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0952	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0953	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0954	AQ00245R	CHIP RESISTOR 82KOHM+-1% 1/16W
R0955	AQ00227R	CHIP RESISTOR 18KOHM+-1% 1/16W
R0956	AQ00234R	CHIP RESISTOR 33KOHM+-1% 1/16W
R0957	AQ00247R	CHIP RESISTOR 100KOHM+-1% 1/16W
R0958	AQ00236R	CHIP RESISTOR 39KOHM+-1% 1/16W
R0959	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0960	AQ00221R	CHIP RESISTOR 10KOHM+-1% 1/16W
R0961	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0965	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0966	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W
R0967	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0969	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0970	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0971	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0974	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0976	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION	SYMBOL NO	P-NO	DESCRIPTION
R0977	0790017	CHIP RESISTOR 33 OHM+-5% 1/16W	R1221	0790029	CHIP RESISTOR 270 OHM+-5% 1/16W
R0978	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1222	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0979	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1223	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0980	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1225	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0981	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1226	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0982	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W	R1227	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0983	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W	R1303	AQ00214R	CHIP RESISTOR 5.6KOHM+-1% 1/16W
R0984	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1312	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0985	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1313	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0992	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1316	0790027	CHIP RESISTOR 180 OHM+-5% 1/16W
R1001	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W	R1317	0790027	CHIP RESISTOR 180 OHM+-5% 1/16W
R1002	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W	R1403	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R1003	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W	R1404	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R1006	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R1405	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R1009	0103823	CHIP RESISTOR 22 OHM+-5% 0.1W	R1406	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R1123	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1407	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R1124	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W	R1408	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R1125	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1409	AQ00236R	CHIP RESISTOR 39KOHM+-1% 1/16W
R1126	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R1410	AQ00236R	CHIP RESISTOR 39KOHM+-1% 1/16W
R1127	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R1411	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W
R1136	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R1412	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W
R1153	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W	R1413	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1154	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W	R1414	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1155	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W	R1416	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1156	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W	R1424	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1157	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W	R1425	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1158	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W	R5307	AQ00198R	CHIP RESISTOR 1.5KOHM+-1% 1/16W
R1161	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5308	AQ00212R	CHIP RESISTOR 4.7KOHM+-1% 1/16W
R1164	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W	R5330	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1165	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5332	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1166	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W	R5333	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1167	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5334	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R1170	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5339	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R1171	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5340	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R1172	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5502	AQ00249R	CHIP RESISTOR 120KOHM+-1% 1/16W
R1173	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5503	AQ00232R	CHIP RESISTOR 27KOHM+-1% 1/16W
R1174	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R5504	AQ00221R	CHIP RESISTOR 10KOHM+-1% 1/16W
R1175	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R5505	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1178	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5506	AQ00214R	CHIP RESISTOR 5.6KOHM+-1% 1/16W
R1179	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5508	AQ00216R	CHIP RESISTOR 6.8KOHM+-1% 1/16W
R1185	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R5509	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R1186	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	R5510	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1188	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5511	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R1189	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5522	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R1190	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W	R5523	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1192	BM00141R	FILTER	R5524	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R1193	BM00141R	FILTER	R5525	0104274	CHIP RESISTOR 1.5KOHM+-1% 1/10W
R1201	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W	D0001	CC11321R	DIODE MA726
R1202	0790069	CHIP RESISTOR 270KOHM+-5% 1/16W	D0002	CC10291R	DIODE 1SS353SP
R1203	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W	D0003	5337422	DIODE DA221
R1204	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	D0350	5337422	DIODE DA221
R1205	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	D0552	CC10291R	DIODE 1SS353SP
R1206	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W	D0553	CC10291R	DIODE 1SS353SP
R1207	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W	D0554	CC10291R	DIODE 1SS353SP
R1208	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W	D0555	CC10291R	DIODE 1SS353SP
R1209	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W	D0556	CC10291R	DIODE 1SS353SP
R1210	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W	D0557	CC10291R	DIODE 1SS353SP
R1211	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W	D0901	CC10291R	DIODE 1SS353SP
R1212	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W	D0902	CC10291R	DIODE 1SS353SP
R1213	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W	D0905	CC11321R	DIODE MA726
R1214	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W	D1002	CC10291R	DIODE 1SS353SP
R1215	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W	D1101	CC10291R	DIODE 1SS353SP
R1216	AQ00231R	CHIP RESISTOR 24KOHM+-1% 1/16W	D1301	5337422	DIODE DA221
R1218	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W	D1302	CC10291R	DIODE 1SS353SP
R1220	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	D5301	CC10161R	DIODE MA781WK

SYMBOL NO	P-NO	DESCRIPTION
IC0001	CK22711R	IC MM6564XFBE
IC0101	1366631	IC HA118189MER
IC0201	CK24801U	IC MB87L1551PMT2
IC0202	CK21332U	IC HD49323AF
IC0203	CK12061R	IC UPD16510GR
IC0301	CK22491R	IC UPC5020GS129
IC0350	CK22501R	IC UPS5020GR-125-8JG
IC0401	CK12241	IC HA118193F [TYPE 765,665]
IC0401	CK20272R	IC LA7458W[TYPE 768,568,565,563,368,360]
IC0461S	CK16471R	IC TDA7052AT
IC0471S	CK22341R	IC NJM2112V-TE1
IC0551	CK23901U	IC BA9736KV
IC0553	CK20191R	IC PQ20WZ51
IC0631	CK18331R	IC LB1950V-TRM
IC0651	CK22031R	IC LB1991V-TRM
IC0671	1366651	IC BA6417F
IC0701	CE10171R	MODULE GP1U101X
IC0901	CK24961U	IC CXP87360-132R
IC0902	CK21712R	IC NJU7285BV
IC0904	CK16994R	IC UPD6461GS-941-E1[TYPE 768,568,368]
IC0904	CK16995R	IC UPD6461GS-947-E1 [TYPE 765,665,660,565,563,360]
IC1104	CK24851U	IC HD6432237M08TE
IC1105	CK24721R	IC AT25160N
IC1111	CK18021R	IC MB88347PFV
IC1201	CK20621R	IC UPC5023GS-147-GJG
IC1301	CK17992R	IC UPD16833AG3
IC1401	FU10323	SENSOR, GYRO
IC1402	FU10324	SENSOR, GYRO
IC1403	CK24841R	IC NJU7018M
IC5501	CK18431R	IC TL5001CD
Q0001	CA11901	TRANSISTOR UPA1770G
Q0002	CA10271R	TRANSISTOR 2SB1424
Q0003	1323279	TRANSISTOR DTC114YE
Q0004	CA11941R	TRANSISTOR 2SK3019
Q0101	1323286	TRANSISTOR UMH9N
Q0102	1323294	TRANSISTOR 2SA1774RS
Q0103	1323294	TRANSISTOR 2SA1774RS
Q0104	CA10162R	TRANSISTOR 2SA1577Q
Q0105	1323279	TRANSISTOR DTC114YE
Q0106	CA10162R	TRANSISTOR 2SA1577Q
Q0107	1323279	TRANSISTOR DTC114YE
Q0109	1323294	TRANSISTOR 2SA1774RS
Q0110	1323294	TRANSISTOR 2SA1774RS
Q0111	1323291	TRANSISTOR 2SC4617
Q0112	1323291	TRANSISTOR 2SC4617
Q0113	1323252	TRANSISTOR XP4501
Q0114	1323286	TRANSISTOR UMH9N
Q0115	1323252	TRANSISTOR XP4501
Q0117	1323291	TRANSISTOR 2SC4617
Q0118	1323279	TRANSISTOR DTC114YE
Q0119	1323291	TRANSISTOR 2SC4617
Q0120	1323294	TRANSISTOR 2SA1774RS
Q0130	1323279	TRANSISTOR DTC114YE
Q0131	1323294	TRANSISTOR 2SA1774RS
Q0132	CA11273R	TRANSISTOR 2SA1037K-S
Q0201	1323294	TRANSISTOR 2SA1774RS
Q0202	1323294	TRANSISTOR 2SA1774RS
Q0204	1323252	TRANSISTOR XP4501
Q0206	1323279	TRANSISTOR DTC114YE
Q0209	1323291	TRANSISTOR 2SC4617
Q0210	1323291	TRANSISTOR 2SC4617
Q0303	1323291	TRANSISTOR 2SC4617
Q0304	1323279	TRANSISTOR DTC114YE
Q0350	1323294	TRANSISTOR 2SA1774RS
Q0351	1323294	TRANSISTOR 2SA1774RS
Q0352	1323294	TRANSISTOR 2SA1774RS
Q0401	1323279	TRANSISTOR DTC114YE
Q0401R	1323279	TRANSISTOR DTC114YE
Q0402M	1323278	TRANSISTOR DTA114YE
Q0403M	1323279	TRANSISTOR DTC114YE
Q0404M	1323291	TRANSISTOR 2SC4617
Q0405	1323291	TRANSISTOR 2SC4617
Q0406	1323291	TRANSISTOR 2SC4617
Q0406R	1323291	TRANSISTOR 2SC4617
Q0407M	1323294	TRANSISTOR 2SA1774RS
Q0461	CA10162R	TRANSISTOR 2SA1577Q
Q0462	1323279	TRANSISTOR DTC114YE
Q0463S	1323279	TRANSISTOR DTC114YE
Q0471	1323291	TRANSISTOR 2SC4617
Q0471R	1323291	TRANSISTOR 2SC4617
Q0474	1323291	TRANSISTOR 2SC4617
Q0475S	1323271	TRANSISTOR DTC144EE
Q0551	1308011	TRANSISTOR MPL1
Q0552	CA10271R	TRANSISTOR 2SB1424R
Q0553	1308011	TRANSISTOR MPL1
Q0555	CA10271R	TRANSISTOR 2SB1424R
Q0556	1323279	TRANSISTOR DTC114YE
Q0557	CA10271R	TRANSISTOR 2SB1424R
Q0559	1308011	TRANSISTOR MPL1
Q0561	1308011	TRANSISTOR MPL1
Q0562	1308011	TRANSISTOR MPL1
Q0563	1323279	TRANSISTOR DTC114YE
Q0570	CA10271R	TRANSISTOR 2SB1424R
Q0571	1323291	TRANSISTOR 2SC4617
Q0572	1323287	TRANSISTOR UMD9N
Q0573	1323287	TRANSISTOR UMD9N
Q0574	1323287	TRANSISTOR UMD9N
Q0575	1323291	TRANSISTOR 2SC4617
Q0576	1323291	TRANSISTOR 2SC4617
Q0577	1323291	TRANSISTOR 2SC4617
Q0578	1323287	TRANSISTOR UMD9N
Q0579	1323279	TRANSISTOR DTC114YE
Q0580	1323252	TRANSISTOR XP4501
Q0701	1323279	TRANSISTOR DTC114YE
Q0732	1323279	TRANSISTOR DTC114YE
Q0901	1323294	TRANSISTOR 2SA1774RS
Q0902	1323291	TRANSISTOR 2SC4617
Q0904	1323294	TRANSISTOR 2SA1774RS
Q0905	5328975	TRANSISTOR 2SC2412K
Q0909	1323279	TRANSISTOR DTC114YE
Q0910	1323278	TRANSISTOR DTA114YE
Q1001	5328221	TRANSISTOR 2SC2620-QC
Q1201	1323291	TRANSISTOR 2SC4617
Q1202	1323291	TRANSISTOR 2SC4617
Q1203	1323142	TRANSISTOR 2SC2411K
Q1301	1323286	TRANSISTOR UMH9N
Q1401	1323279	TRANSISTOR DTC114YE
Q1402	1323252	TRANSISTOR XP4501
Q5303	1323279	TRANSISTOR DTC114YE
Q5304	1323279	TRANSISTOR DTC114YE
Q5305	1323293	TRANSISTOR 2SC4617 (R/S)
Q5306	1323279	TRANSISTOR DTC114YE
Q5307	1323279	TRANSISTOR DTC114YE
Q5501	1323272	TRANSISTOR DTA144EE
Q5502	1323279	TRANSISTOR DTC114YE
Q5505	1323293	TRANSISTOR 2SC4617 (R/S)
Q5506	1323293	TRANSISTOR 2SC4617 (R/S)
Q5510	1323293	TRANSISTOR 2SC4617 (R/S)
Q5511	1308011	TRANSISTOR MPL1

SYMBOL NO	P-NO	DESCRIPTION
Q5512	1323012	TRANSISTOR 2SC3647
Q5513	1323012	TRANSISTOR 2SC3647
T0551	BC10331R	TRANS
T5501	BC10381R	TRANSFORMER
L0101	BA10334R	COIL 10UH
L0102	BA10142R	COIL
L0103	BA10315R	COIL 150UH
L0104	BA10147R	COIL 22UH
L0105	BA10143R	COIL 10UH
L0106	BA10145R	COIL
L0107	BA10154R	COIL 82UH
L0108	0773096	COIL,CHOKE 220UH
L0110	BA10148R	COIL 27UH
L0111	BA10582R	COIL 47UH
L0201	BA10577R	COIL 10UH
L0202	BA10575R	COIL
L0203	BA10575R	COIL
L0209	BA10577R	COIL 10UH
L0210	BA10142R	COIL
L0211	0773117	CHOKE COIL 8.2UH+-5%
L0214	0773131	CHOKE COIL 82UH+-5%
L0301	BA10582R	COIL 47UH
L0350	BA10577R	COIL 10UH
L0401	BA10582R	COIL 47UH
L0402M	BA10582R	COIL 47UH
L0461	BA10334R	COIL 10UH
L0551	BA10691R	COIL
L0552	BA10693R	COIL
L0554	BA10695R	COIL
L0558	BA10577R	COIL 10UH
L0559	BA10582R	COIL 47UH
L0560	BA10582R	COIL 47UH
L0561	BA10695R	COIL
L0563	BA10691R	COIL
L0564	BA10695R	COIL
L0565	BA10695R	COIL
L0566	BA10582R	COIL 47UH
L0567	BA10582R	COIL 47UH
L0568	BA10582R	COIL 47UH
L0569	BA10582R	COIL 47UH
L0701	BA10579R	COIL 22UH
L0731	BA10577R	COIL 10UH
L0732	BA10579R	COIL 22UH
L0901	BA10577R	COIL 10UH
L0902	BA10577R	COIL 10UH
L0903	BA10582R	COIL 47UH
L1103	BA10577R	COIL 10UH
L5301	BA10577R	COIL 10UH
L5302	BA10584R	COIL 100UH
L5303	BA10584R	COIL 100UH
L5304	BA10577R	COIL 10UH
L5501	BA10333R	COIL 4.7UH
L5502	BA10693R	COIL
L5503	BA10698R	COIL
LED0701	CC10772R	DIODE SML-010LT
LED0751	CC11251R	DIODE SML-010MT
X0201	BL11092R	CRYSTAL 28.5MHZ
X0901	BL10901R	CRYSTAL
X0902	BL10311R	CRYSTAL
CN0201	EK11361	FLEXIBLE,CONNECTOR
CN0903	EF10265	CONNECTOR
⚠F0551	FM10261R	FUSE 1.5A
⚠F0552	FM10261R	FUSE 1.5A
⚠F0553	FM10261R	FUSE 1.5A
PG0001	1830309	CONNECTOR

SYMBOL NO	P-NO	DESCRIPTION
PG0101	EA11472R	PLUG
PG0201	1830118	CONNECTOR
PG0301	EA11043R	CONNECTOR
PG0471	5668671	MINI PLUG [TYPE 768,660,568,565,563,368,360]
PG0471	5668673	MINI PLUG [TYPE 765,665]
PG0552	5669194	PLUG
PG0601	5692362	MINI PLUG
PG0602	EA11474R	PLUG
PG0603	EA11471R	PLUG
PG0604	5668671	MINI PLUG
PG0701	5669199	PLUG
PG0731	EA10991R	CONNECTOR
PG0732	5669191	PLUG
PG0733	EA11364R	CONNECTOR
PG0734	EA11359R	CONNECTOR
PG0735	5669193	MINI PLUG
PG0736	5669166	PLUG
PG0901	EA11473R	PLUG
PG0902	EA10642R	CONNECTOR
PG0903	5669199	PLUG
PG0904	EA11741R	CONNECTOR
PG0905	5669196	PLUG
PG0906	5669167	MINI PLUG
PG0951	EA10971R	PLUG
PG1001	1830117	CONNECTOR
PG1301	EA10346R	PLUG
PG5301	EA11476R	CONNECTOR
PG5302	EA11359R	CONNECTOR
PG5303	EA11591R	CONNECTOR
PG5501	EA11477R	CONNECTOR
PG5701	EA11364R	CONNECTOR
SW0701	FB10321R	SWITCH
SW0702	FB10201R	SWITCH
SW0761	1742012	SWITCH
SW0762	1742012	SWITCH
SW0763	1742012	SWITCH
SW0764	FB10272R	SWITCH
SW0765	1742012	SWITCH
SW0766	1742012	SWITCH
SW0767	1742012	SWITCH
SW0768	FB10272R	SWITCH
SW0769	1742012	SWITCH
SW0770	1742012	SWITCH
SW0771	FB10272R	SWITCH
SW0772	FB10272R	SWITCH
SW0773	5635331	SWITCH
SW0781	1742012	SWITCH
SW5302	FB10272R	SWITCH
SW5303	FB10272R	SWITCH

CAUTION

Lithium battery; danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacuturer's instructions.

When replacing the lithium battery it is important to use the same type and connect it correctly.
WARNING:
- Lithium batteries contain dangerous chemicals.
- Handle and dispose of with great care.
- Do not throw in a fire.
- Do not short circuit it.
- For disposal place in a plastic bag and put in waste bin.

CAUTION (COLOR LCD)

LCD display; the liquid crystal display (LCD) panel is mode by highly precise technology.
More than 99.99% of its picture elements (pixels) are effective, but some (less than 0.01%) may appear as colored bright dots. This mode not indicate a fault as the LCD panel stretches the limits of current technology.

CAUTION (CRT EVF)

Be careful of the section painted in white on the electronic viewfinder circuit board as it generates a high voltage.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

X-RAY RADIATION

The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in this viewfinder is specially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, Hitachi approved one.

How to discriminate the "TYPE" identifications in the manual

The parts and circuits are identified by "TYPE" in this manual to discriminate the differences between models. The TYPE numbers are the same as the model numbers. The table below shows how to read the type identifications.

TYPE identification	**Model name**
TYPE 768	VM-H768LE(AU)/H768LE(SW)
TYPE 765	VM-H765LE/H765LE(UK)
TYPE 665	VM-H665LE
TYPE 660	VM-H660E
TYPE 568	VM-E568LE(AU)/E568LE(SW)

TYPE identification	**Model name**
TYPE 565	VM-E565LE
TYPE 563	VM-E563LE(UK)
TYPE 465	Not used
TYPE 368	VM-E368E(AU)/E368E(SW)
TYPE 360	VM-E360E/E360E(UK)

How to discriminate the "Model" identifications in electric circuit adjustment in the manual.

If the adjustment values (input data) vary depending on the model, they will be individually described using "MODEL" indications. The following shows the relationship between the "MODEL" indications and model names:

MODEL identification	**Model name**
Model HE	VM-H765LE/H765LE(UK) VM-H665LE VM-H660E
Model EE	VM-H768LE(AU)/H768LE(SW) VM-E568LE(AU)/E568LE(SW) VM-E565LE

MODEL identification	**Model name**
Model EE	VM-E563LE(UK) VM-E368E(AU)/E368E(SW) VM-E360E/E360E(UK)
Model HA	Not used
Model EA	Not used

Notes When Using Service Manual

The following shows the contents to be noted when using service manual:

1. Value units used in parts list

Certain symbols are indicated below for value units of resistors, capacitors and coils in parts list. When you read them note the following regular indications:

Parts	Indication in list	Regular indication
Resistor	KOHM	k Ω
Capacitor	UF	μF
	PF	pF
Coil	UH	μH
	MH	mH

2. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication ········ Ω K ········ k Ω M ········ M Ω
Tolerance	No indication ········ ±5% (All tolerances other than ±5% are indicated in schematic diagrams)
Power capacitance	No indication ········ 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ········ μF P ········ pF
Dielectric strength	No indication ········ 50V (All dielectric strengths other than 50V are indicated in schematic diagrams)

[Coils]

Item	Indication
Value	μ ········ μH m ········ mH

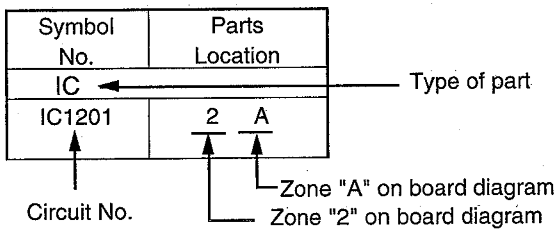
3. Identifications of sides A/B in circuit board diagrams

1) Board having a pattern on one side and parts on both sides.
   - Side A: Shows discrete parts, viewed from the pattern side.
   - Side B: Shows leadless parts, viewed from the pattern side.
2) Board having patterns on both sides and parts on both sides.
   - Side A: Shows parts and patterns which can be seen when the case is opened.
   - Side B: Shows parts and the pattern on the back of side A.

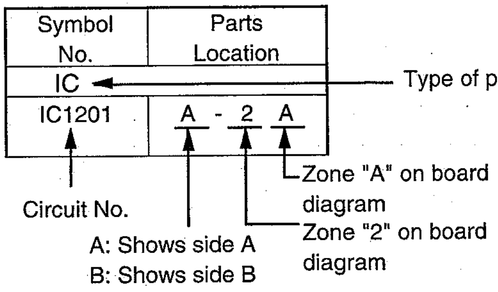
4. Table for indexing locations of parts

This table shows locations of each part on circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

1) One diagram indicated for each board


Symbol No.
Parts Location
IC
Type of part
IC1201
2 A
Circuit No.
Zone "A" on board diagram
Zone "2" on board diagram

2) Two diagrams indicated for each board


Symbol No.
Parts Location
IC
Type of part
IC1201
A - 2 A
Circuit No.
A: Shows side A
B: Shows side B
Zone "A" on board diagram
Zone "2" on board diagram

CONTENTS

CHAPTER 1 GENERAL INFORMATION

SPECIFICATIONS ········· E1-1
COMPARISON OF FEATURES ········· E1-2
COMPARISON OF MAIN CONTROL ICs ········· E1-3
JIGS AND TAPES FOR SERVICE ········· E1-5
HOW TO USE THE
    EXTENSION CABLES AND JIGS ········· E1-6
SERVICE POSITION ········· E1-6
SERVICE MANUAL ABBREVIATION LIST ········· E1-7
EXTRACT FROM THE INSTRUCTION MANUAL ········· E1-9

CHAPTER 2 DISASSEMBLY

1. BEFORE STARTING DISASSEMBLY ········· E2-1
    1.1 Disassembly Procedure ········· E2-1
2. CASES AND CIRCUIT BOARDS REMOVAL ········· E2-2
    2.1 Jack Cover, Front Cover Assembly, Lens Cover ········· E2-2
    2.2 PSW Circuit Board, Microphone Unit, DC Light, Front Cover ········· E2-2
    2.3 LCD Case-U, LCD Block, Cassette Lid, Top Cover ········· E2-3
    2.4 L-Case Assembly, R-Case Assembly ········· E2-4
    2.5 EVF Assembly, Speaker, CON Circuit Board, Fulcrum, L-Case ········· E2-5
    2.6 Camera Chassis Assembly, VCR Chassis Assembly, Jack Unit, Rear Cover, Power Terminal Unit ········· E2-6
    2.7 VCA Circuit Board, Mechanism Frame, UH Mechanism ········· E2-7
    2.8 Hand Strap, TW/PW Switch, R-Case ········· E2-7
    2.9 LCD Circuit Board, Back Light, LCD Module, LCD Case-B ········· E2-8
    2.10 EVF Case-R, EVF Case-L, Eye Piece ········· E2-8
3. HOW TO OPERATE THE MECHANISM MANUALLY ········· E2-9

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT

1. CONNECTION FOR ADJUSTMENT ········· E3-1
    1.1 Before Starting Adjustment ········· E3-1
2. CAMERA SECTION ADJUSTMENT ········· E3-2
    2.1 Test Equipment Necessary for Adjustment E3-2
    2.2 List of Charts for Camera Adjustment ········· E3-2
    2.3 Adjustment Conditions ········· E3-2
    2.4 Preset Position of Switches and Controls During Adjustment ········· E3-2
    2.5 Check After Replacing Major Components in the Camera Section ········· E3-3
    2.6 Adjustment Procedure ········· E3-3
    2.7 Color LCD Monitor Adjustment ········· E3-9
3. VCR SECTION ADJUSTMENT ········· E3-10
    3.1 Test Equipment and Alignment Tapes Necessary for Adjustment ········· E3-10
    3.2 Adjustment Conditions ········· E3-10
    3.3 Preset Position of Switches and Controls During Adjustment ········· E3-10
    3.4 Check After Replacing Major Components in the VCR Section ········· E3-10
    3.5 System Control/Servo Circuits Adjustment · E3-10
4. ERROR MESSAGE ········· E3-12
    4.1 Camera Digital Adjustment ········· E3-12
    4.2 Autofocus Adjustment ········· E3-13
    4.3 Spot Noise Adjustment ········· E3-13
    4.4 VCR Adjustment ········· E3-14
5. TROUBLESHOOTING OF AUTOFOCUS ········· E3-15

CHAPTER 4 EXPLODED VIEWS

CABINET (1-1) ········· 4-1
CABINET (1-2) ········· 4-2
CABINET (2) ········· 4-3
UH MECHANISM ········· 4-4
ACCESSORIES ········· 4-2

CHAPTER 5 REPLACEMENT PARTS LIST

1. MECHANICAL PARTS LIST ········· 5-1
2. ELECTRICAL PARTS LIST ········· 5-2

CHAPTER 6 SCHEMATIC AND CIRCUIT BOARD AND BLOCK DIAGRAMS/ MICROPROCESSOR PIN FUNCTION TABLES

INTERNAL WIRING DIAGRAM ········· 6-1

SCHEMATIC/CIRCUIT BOARD
SENSOR/GYRO [SE] ········· 6-3 /6-33, 35
CAMERA PROCESS [VCA] ········· 6-5 /6-37, 43
SYSTEM CONTROL [VCA] ········· 6-7 /6-37, 43
MECHA. STATE SW/MECHA. SENSOR ········· 6-9 / -----
POWER SW [PSW] ········· 6-10 /6-33, 35
SERVO [VCA] ········· 6-11 /6-37, 43
AUDIO -STEREO- [VCA] ········· 6-13 /6-37, 43
AUDIO -MONAURAL- [VCA] ········· 6-15 /6-37, 43
REGULATOR [VCA] ········· 6-17 /6-37, 43
VIDEO PROCESS [VCA] ········· 6-21 /6-37, 43
CHARGE [VCA] ········· 6-24 /6-37, 43
CONTROL [CON] ········· 6-25 /6-33, 35
LCD DRIVE [LCD] ········· 6-27 / 6-31

IC BLOCK DIAGRAM ········· 6-29
DIFFERENCE TABLE
    For SE and CON circuit boards ········· 6-32
    For VCA circuit board ········· 6-39, 41
IDENTIFICATION OF PARTS LOCATION
    For VCA circuit board ········· 6-45
    For CON and LCD circuit board ········· 6-47

WAVEFORMS
    SENSOR ········· 6-3
    SYSTEM CONTROL ········· 6-9
    SERVO ········· 6-11
    VIDEO PROCESS ········· 6-19

BLOCK DIAGRAMS
    1. OVERALL ········· 6-49
    2. MAIN CONTROL ········· 6-51
    3. SERVO ········· 6-53
    4. CAMERA & VIDEO PROCESS ········· 6-55
    5. AUDIO -STEREO- ········· 6-57
    6. AUDIO -MONAURAL- ········· 6-59
    7. POWER ········· 6-61

MICROPROCESSOR PIN FUNCTION TABLE
    1. Digital Microprocessor (IC1104: D-μP) ········· 6-63
    2. System Control Microprocessor (IC901: S-μP) ·· 6-65

CHAPTER 7 APPENDIX

1. SELF-DIAGNOSTIC FUNCTION ········· E7-1
2. DEMONSTRATION (DEMO) MODE ········· E7-6

CHAPTER 8 VM-ACE5E (AC ADAPTER)

EXPLODED VIEW &
    REPLACEMENT PARTS LIST ········· 8-1

CHAPTER 1 GENERAL INFORMATION

SPECIFICATIONS

General Specifications

Power requirements	7.2V DC
Power consumption	VM-H768LE(AU)/H768LE(SW): 3.6W (when recording/LCD monitor OFF) 4.1W (when recording/LCD monitor ON) VM-H765LE/H765LE(UK): 3.6W (when recording/LCD monitor OFF) 4.1W (when recording/LCD monitor ON) VM-H665LE: 3.5W (when recording/LCD monitor OFF) 4.0W (when recording/LCD monitor ON) VM-E568LE(AU)/E568LE(SW): 3.4W (when recording/LCD monitor OFF) 3.8W (when recording/LCD monitor ON) VM-E565LE: 3.4W (when recording/LCD monitor OFF) 3.8W (when recording/LCD monitor ON) VM-E563LE(UK): 3.4W (when recording/LCD monitor OFF) 3.8W (when recording/LCD monitor ON) VM-H660E: 3.5 W (when recording) VM-E368E(AU)/E368E(SW): 3.4W (when recording) VM-E360E/E360E(UK): 3.4W (when recording)
Operating temperature	0°C to 40°C
Operating humidity	< 80 %
Storage temperature	-20°C to 60°C
Dimensions	111.5 (W) mm x 111.5 (H) mm x 202 (D) mm
Weight	VM-H768LE(AU)/H768LE(SW)/H765LE/H765LE(UK)/H665LE & VM-E568LE(AU)/E568LE(SW)/E565LE/E563LE(UK): Approx. 836 g (without battery pack and cassette) VM-H660E/E368E(AU)/E368E(SW)/E360E/E360E(UK): Approx. 757 g (without battery pack and cassette)

Video Recorder Specifications

Format	8 mm
Record/playback	Two video record/playback heads
Video signal	PAL colour & CCIR monochrome signals 625 lines
Tape speed	SP: 20.05 mm/s
Video output	1.0 Vp-p, 75 ohm
Audio output	-8 dBs, less than 1k ohm
Fast forward/rewind time	Approx. 6 minutes with P5-90 cassette

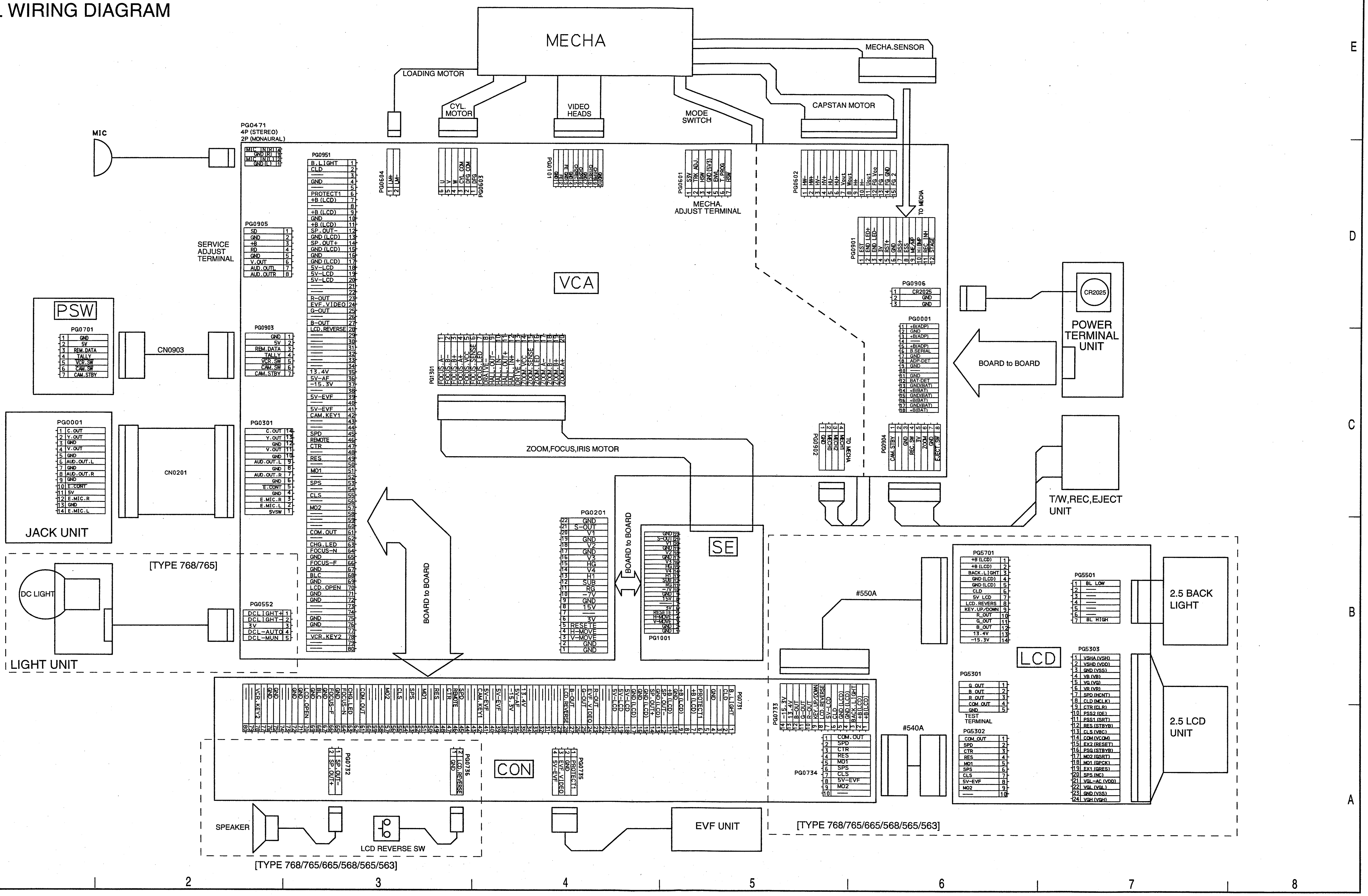
Camera Specifications

Scanning	625 lines/50 fields/25 frames
Required minimum illumination	VM-H768LE(AU)/H768LE(SW): 0.3 lx VM-H765LE/H765LE(UK)/H665LE/H660E: 0.5 lx VM-E568LE(AU)/E568LE(SW)/E565LE/E563LE(UK)/ E368E(AU)/E368E(SW)/E360E/E360E(UK): 0.3 lx
Camera device	1/4 inch C.C.D.
Lens	F1.6 to 3.8 (4 to 88 mm) 22:1 power zoom lens with auto focus and auto iris functions
Lens diameter	46 mm

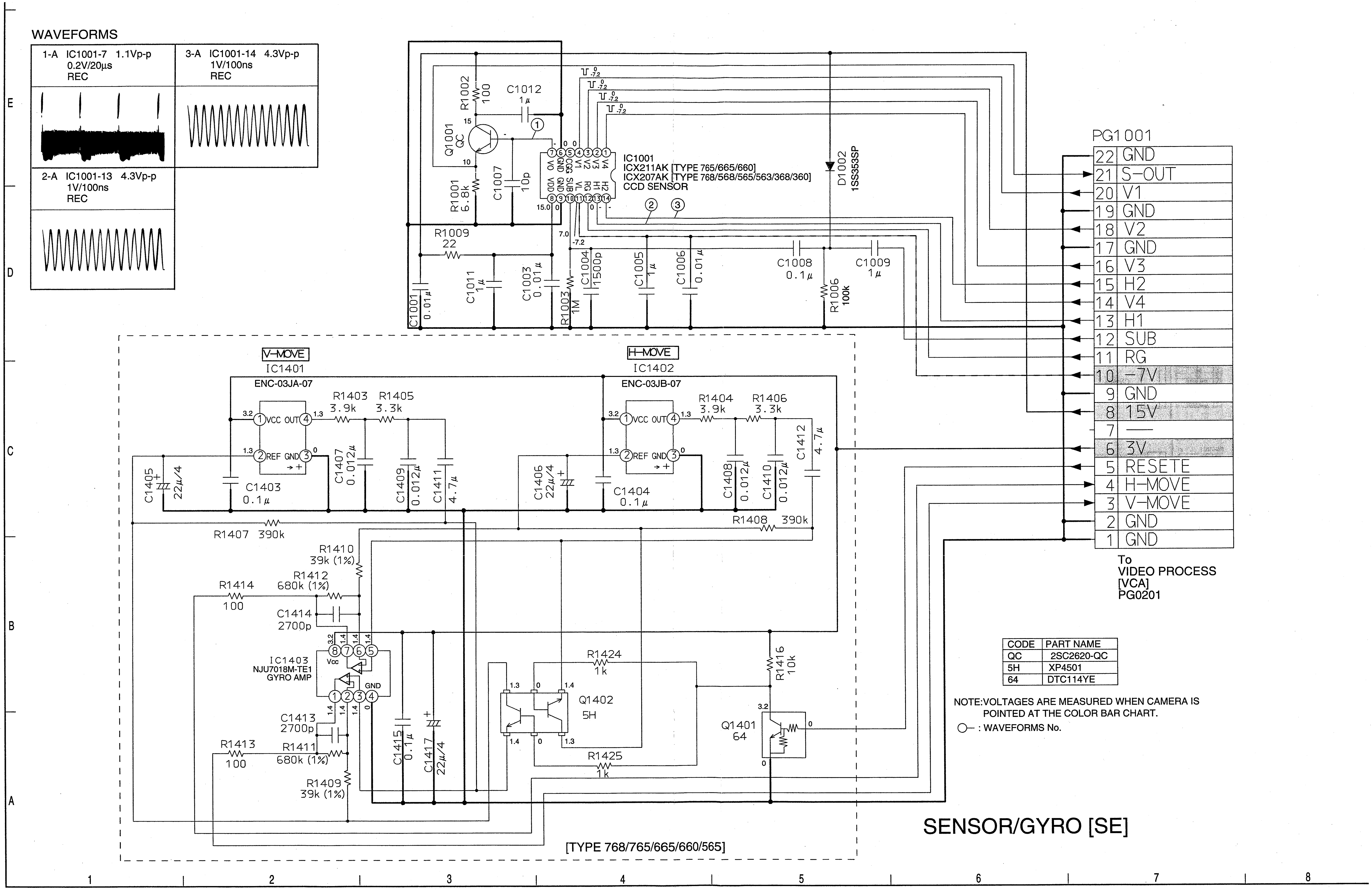
CHAPTER 6

SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/ MICROPROCESSOR PIN FUNCTION TABLE

INTERNAL WIRING DIAGRAM


MECHA
MECHA.SENSOR
LOADING MOTOR
CYL. MOTOR
VIDEO HEADS
MODE SWITCH
CAPSTAN MOTOR
MIC
PG0471
4P (STEREO)
2P (MONAURAL)
PG0951
PG0604
PG0903
PG0101
PG0501
MECHA. ADJUST TERMINAL
PG0502
TO MECHA
PG0901
PG0905
SERVICE ADJUST TERMINAL
PSW
PG0701
CN0903
VCA
PG0906
CR2025
PG0001
POWER TERMINAL UNIT
BOARD to BOARD
PG1301
JACK UNIT
CN0201
PG0301
ZOOM,FOCUS,IRIS MOTOR
PG0502
PG0904
T/W,REC,EJECT UNIT
[TYPE 768/765]
DC LIGHT
LIGHT UNIT
PG0552
BOARD to BOARD
PG0201
SE
PG1001
PG5701
PG5501
2.5 BACK LIGHT
#550A
LCD
PG5303
PG5301
TEST TERMINAL
PG5302
2.5 LCD UNIT
#540A
PG0734
PG0733
PG0731
PG0732
PG0736
CON
PG0735
SPEAKER
LCD REVERSE SW
EVF UNIT
[TYPE 768/765/665/568/565/563]
[TYPE 768/765/665/568/565/563]
E
D
C
B
A
1
2
3
4
5
6
7
8

SENSOR/GYRO [SE] SCHEMATIC DIAGRAM

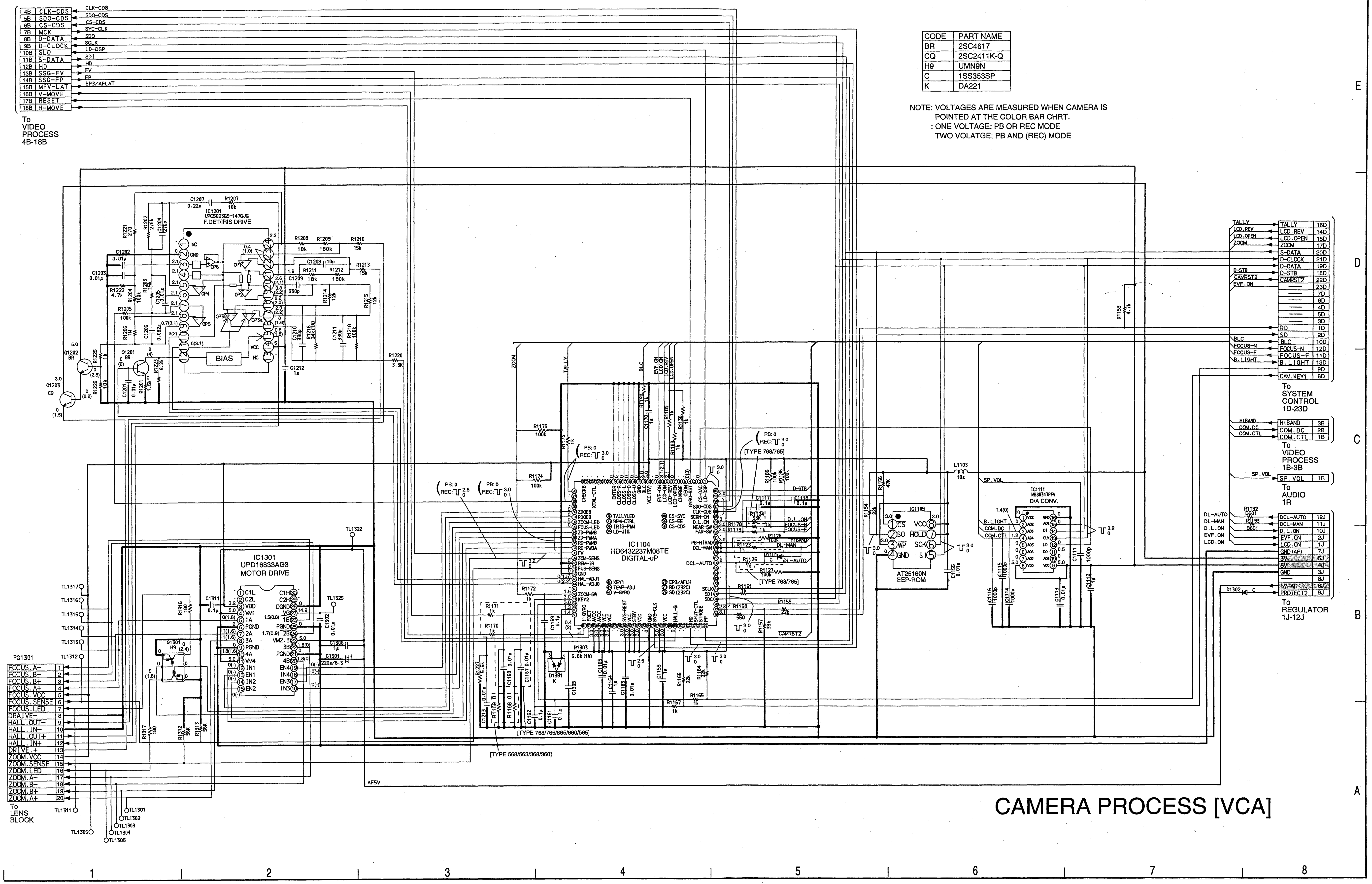

WAVEFORMS
1-A IC1001-7 1.1Vp-p 0.2V/20µs REC
2-A IC1001-13 4.3Vp-p 1V/100ns REC
3-A IC1001-14 4.3Vp-p 1V/100ns REC
R1002 100
C1012 1µ
Q1001 QC
R1001 6.8k
C1007 10p
IC1001
ICX211AK [TYPE 765/665/660]
ICX207AK [TYPE 768/568/565/563/368/360]
CCD SENSOR
VO GND CGG V4 V3 V2 V1
VDD GND SUB VL RG H1 H2
D1002 1SS353SP
R1009 22
C1001 0.01µ
C1011 1µ
C1003 0.01µ
R1003 1M
C1004 1500p
C1005 1µ
C1006 0.01µ
C1008 0.1µ
C1009 1µ
R1006 100k
PG1001
22 GND
21 S-OUT
20 V1
19 GND
18 V2
17 GND
16 V3
15 H2
14 V4
13 H1
12 SUB
11 RG
10 -7V
9 GND
8 15V
7 —
6 3V
5 RESETE
4 H-MOVE
3 V-MOVE
2 GND
1 GND
To VIDEO PROCESS [VCA] PG0201
V-MOVE
IC1401
ENC-03JA-07
H-MOVE
IC1402
ENC-03JB-07
VCC OUT REF GND
R1403 3.9k
R1405 3.3k
R1404 3.9k
R1406 3.3k
C1405 22µ/4
C1403 0.1µ
C1407 0.012µ
C1409 0.012µ
C1411 4.7µ
C1406 22µ/4
C1404 0.1µ
C1408 0.012µ
C1410 0.012µ
C1412 4.7µ
R1407 390k
R1408 390k
R1410 39k (1%)
R1412 680k (1%)
R1414 100
C1414 2700p
IC1403
NJU7018M-TE1
GYRO AMP
C1413 2700p
R1413 100
R1411 680k (1%)
R1409 39k (1%)
C1415 0.1µ
C1417 22µ/4
R1424 1k
Q1402 5H
R1425 1k
R1416 10k
Q1401 64
[TYPE 768/765/665/660/565]
SENSOR/GYRO [SE]
1 2 3 4 5 6 7 8
A B C D E

CODE	PART NAME
QC	2SC2620-QC
5H	XP4501
64	DTC114YE

NOTE:VOLTAGES ARE MEASURED WHEN CAMERA IS POINTED AT THE COLOR BAR CHART.

○– : WAVEFORMS No.

CAMERA PROCESS [VCA] SCHEMATIC DIAGRAM



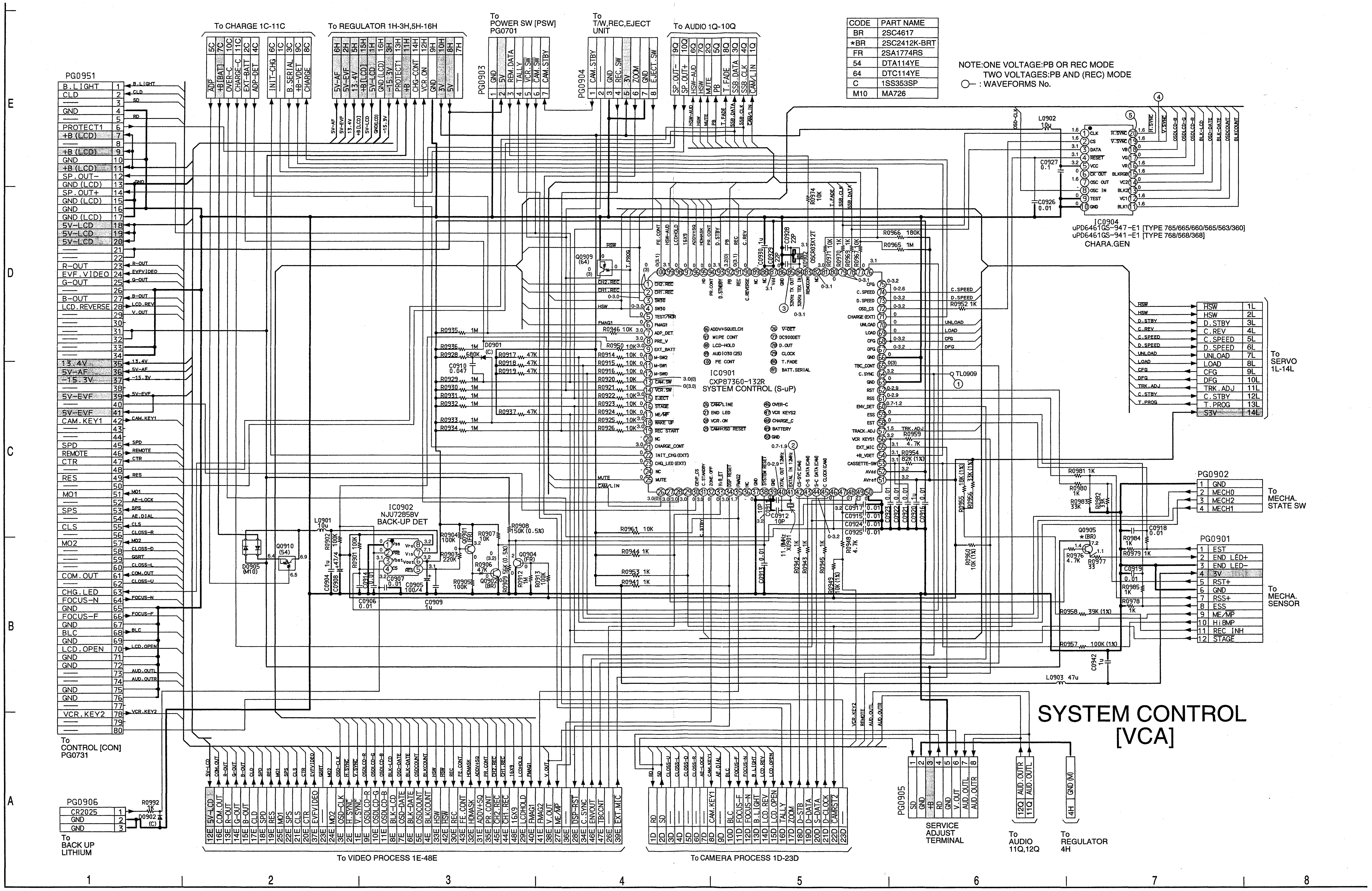
4B CLK-CDS
5B SDO-CDS
6B CS-CDS
7B MCK
8B D-DATA
9B D-CLOCK
10B SLD
11B S-DATA
12B HD
13B SSG-FV
14B SSG-FP
15B MFV-LAT
16B V-MOVE
17B RESET
18B H-MOVE
To VIDEO PROCESS 4B-18B
IC1201 UPC5023GS-147GJG F.DET/IRIS DRIVE
BIAS
Q1202 BR
Q1201 BR
Q1203 CQ
IC1301 UPD16833AG3 MOTOR DRIVE
Q1301 H9
PG1301
FOCUS.A-
FOCUS.B-
FOCUS.B+
FOCUS.A+
FOCUS.VCC
FOCUS.SENSE
FOCUS.LED
DRAIVE-
HALL.OUT-
HALL.IN-
HALL.OUT+
HALL.IN+
DRIVE.+
ZOOM.VCC
ZOOM.SENSE
ZOOM.LED
ZOOM.A-
ZOOM.B-
ZOOM.B+
ZOOM.A+
To LENS BLOCK
IC1104 HD6432237M08TE DIGITAL-uP
IC1105 AT25160N EEP-ROM
IC1111 MB88347PFV D/A CONV.
L1103 10μ
D1301 K
D1302 C
[TYPE 768/765]
[TYPE 768/765/665/660/565]
[TYPE 568/563/368/360]
AF5V
TALLY 16D
LCD.REV 14D
LCD.OPEN 15D
ZOOM 17D
S-DATA 20D
D-CLOCK 21D
D-DATA 19D
D-STB 18D
CAMRST2 22D
RD 1D
SD 2D
BLC 10D
FOCUS-N 12D
FOCUS-F 11D
B.LIGHT 13D
CAM.KEY1 8D
To SYSTEM CONTROL 1D-23D
HIBAND 3B
COM.DC 2B
COM.CTL 1B
To VIDEO PROCESS 1B-3B
SP.VOL 1R
To AUDIO 1R
DCL-AUTO 12J
DCL-MAN 11J
D.L.ON 10J
EVF.ON 2J
LCD.ON 1J
GND (AF) 7J
3V 5J
5V 4J
GND 3J
5V-AF 6J
PROTECT2 9J
To REGULATOR 1J-12J
E
D
C
B
A
1
2
3
4
5
6
7
8

CODE	PART NAME
BR	2SC4617
CQ	2SC2411K-Q
H9	UMN9N
C	1SS353SP
K	DA221

NOTE: VOLTAGES ARE MEASURED WHEN CAMERA IS POINTED AT THE COLOR BAR CHRT.
: ONE VOLTAGE: PB OR REC MODE
TWO VOLATGE: PB AND (REC) MODE

CAMERA PROCESS [VCA]

SYSTEM CONTROL [VCA] SCHEMATIC DIAGRAM



To CHARGE 1C-11C
To REGULATOR 1H-3H,5H-16H
To POWER SW [PSW] PG0701
To T/W,REC,EJECT UNIT
To AUDIO 1Q-10Q
PG0951
B.LIGHT
CLD
GND
PROTECT1
+B (LCD)
SP.OUT-
GND (LCD)
SP.OUT+
5V-LCD
R-OUT
EVF.VIDEO
G-OUT
B-OUT
LCD.REVERSE
13.4V
5V-AF
-15.3V
5V-EVF
CAM.KEY1
SPD
REMOTE
CTR
RES
MO1
SPS
CLS
MO2
COM.OUT
CHG.LED
FOCUS-N
FOCUS-F
BLC
LCD.OPEN
VCR.KEY2
To CONTROL [CON] PG0731
PG0903
PG0904
IC0901
CXP87360-132R
SYSTEM CONTROL (S-uP)
IC0902
NJU7285BV
BACK-UP DET
IC0904
uPD6461GS-947-E1 [TYPE 765/665/660/565/563/360]
uPD6461GS-941-E1 [TYPE 768/568/368]
CHARA.GEN
HSW
D.STBY
C.REV
C.SPEED
D.SPEED
UNLOAD
LOAD
CFG
DFG
TRK.ADJ
C.STBY
T.PROG
S3V
To SERVO 1L-14L
PG0902
MECH0
MECH2
MECH1
To MECHA. STATE SW
PG0901
EST
END LED+
END LED-
3V
RST+
RSS+
ESS
ME/MP
Hi8MP
REC INH
STAGE
To MECHA. SENSOR
PG0906
CR2025
To BACK UP LITHIUM
To VIDEO PROCESS 1E-48E
To CAMERA PROCESS 1D-23D
PG0905
SERVICE ADJUST TERMINAL
To AUDIO 11Q,12Q
To REGULATOR 4H

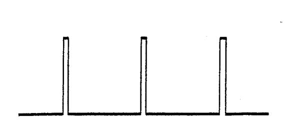
SYSTEM CONTROL [VCA]

CODE	PART NAME
BR	2SC4617
*BR	2SC2412K-BRT
FR	2SA1774RS
54	DTA114YE
64	DTC114YE
C	1SS353SP
M10	MA726

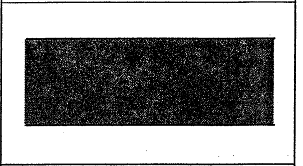
NOTE:ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
○ : WAVEFORMS No.

SYSTEM CONTROL WAVEFORMES

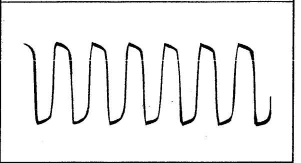
1-A TL909 3.0Vp-p
1V/20μs
REC/PLAY



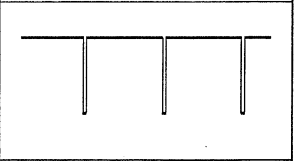
2-A IC901-41 200mVp-p
0.5V/20μs
REC/PLAY



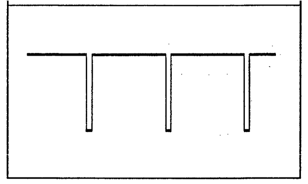
3-A IC901-85 3.5Vp-p
1V/20μs
REC/PLAY



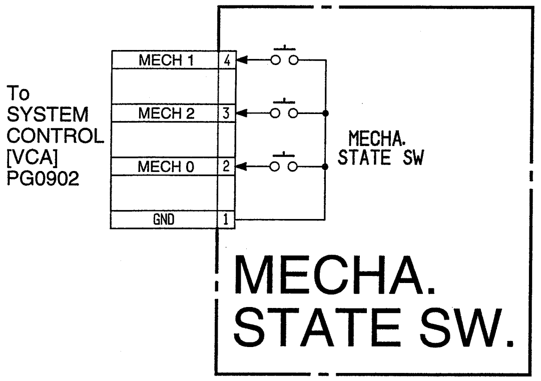
4-A IC904-19 3.0Vp-p
1V/5ms
REC/PLAY

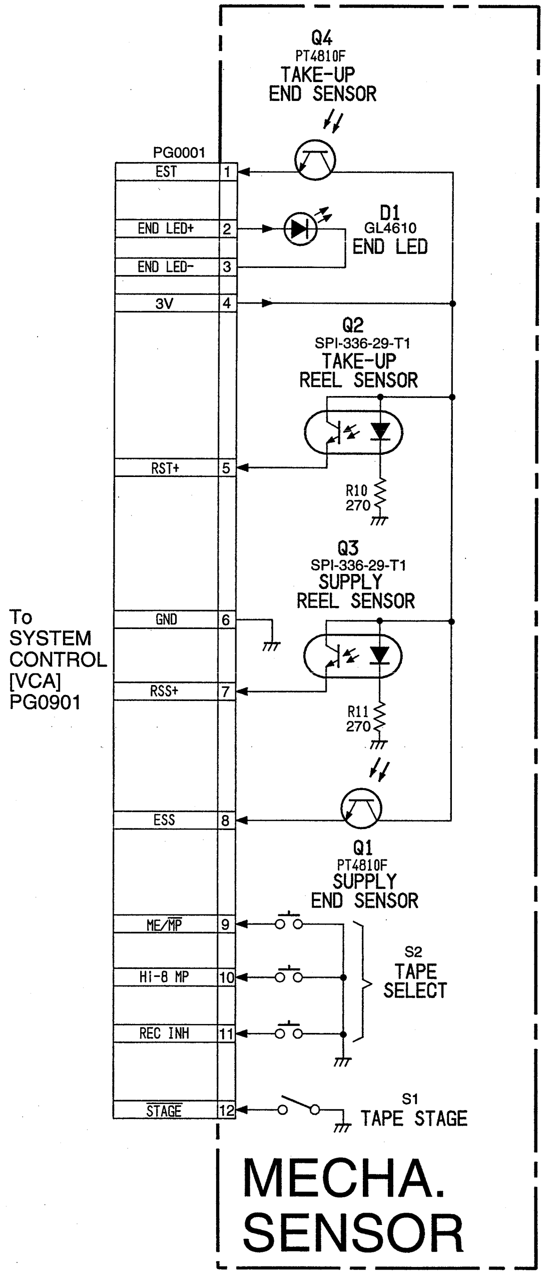


5-A IC904-20 3.0Vp-p
1V/20μs
REC/PLAY

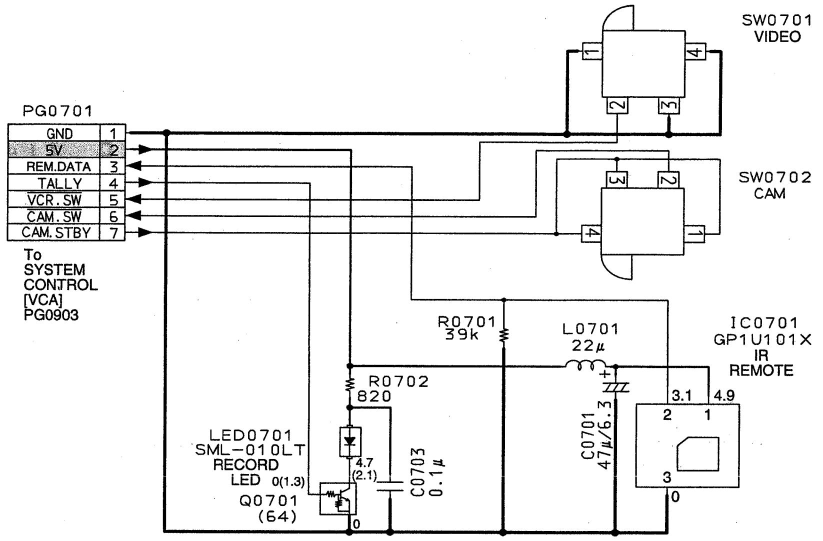


MECHA. STATE SWITCH/MECHA. SENSOR SCHEMATIC DIAGRAMS


To
SYSTEM
CONTROL
[VCA]
PG0902
MECH 1 4
MECH 2 3
MECH 0 2
GND 1
MECHA.
STATE SW
MECHA.
STATE SW.


PG0001
EST 1
END LED+ 2
END LED- 3
3V 4
RST+ 5
GND 6
RSS+ 7
ESS 8
ME/MP 9
HI-8 MP 10
REC INH 11
STAGE 12
To
SYSTEM
CONTROL
[VCA]
PG0901
Q4
PT4810F
TAKE-UP
END SENSOR
D1
GL4610
END LED
Q2
SPI-336-29-T1
TAKE-UP
REEL SENSOR
R10
270
Q3
SPI-336-29-T1
SUPPLY
REEL SENSOR
R11
270
Q1
PT4810F
SUPPLY
END SENSOR
S2
TAPE
SELECT
S1
TAPE STAGE
MECHA.
SENSOR

POWER SW [PSW] SCHEMATIC DIAGRAM

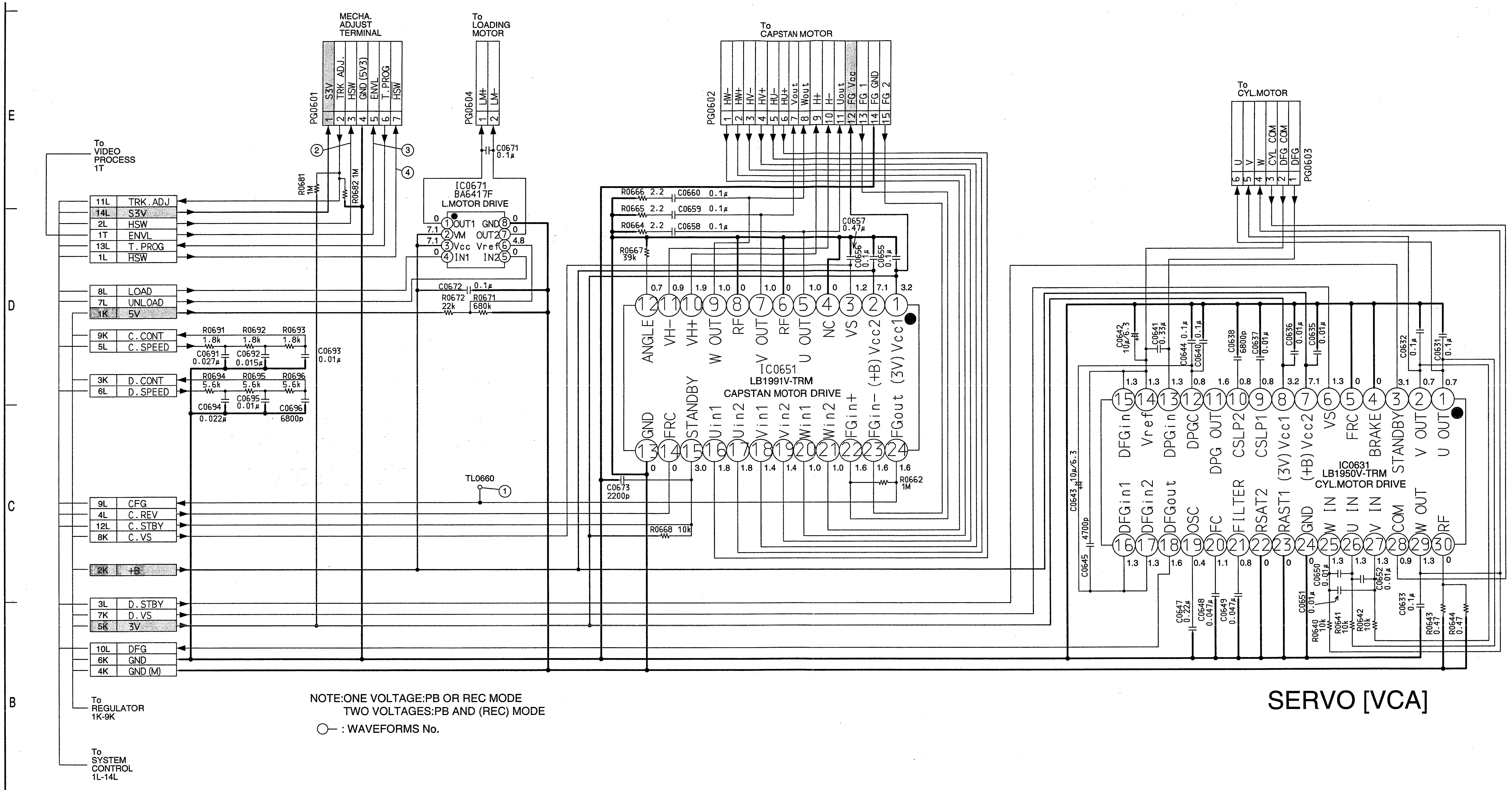

PG0701
GND 1
5V 2
REM.DATA 3
TALLY 4
VCR.SW 5
CAM.SW 6
CAM.STBY 7
To
SYSTEM
CONTROL
[VCA]
PG0903
SW0701
VIDEO
SW0702
CAM
R0701
39k
L0701
22μ
IC0701
GP1U101X
IR
REMOTE
3.1
4.9
2
1
3
0
R0702
820
LED0701
SML-010LT
RECORD
LED 0(1.3)
4.7
(2.1)
Q0701
(64)
C0703
0.1μ
C0701
47μ/6.3

CODE	PART NAME
64	DTC114YE

*ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

POWER SW [PSW]

SERVO [VCA] SCHEMATIC DIAGRAM

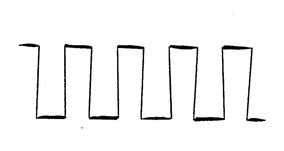
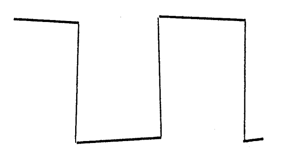
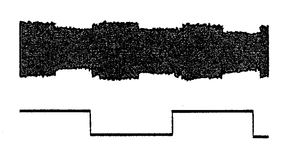
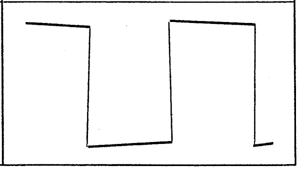

MECHA. ADJUST TERMINAL
PG0601
S3V
TRK ADJ.
HSW
GND (5V3)
ENVL
T.PROG
HSW
To LOADING MOTOR
PG0604
LM+
LM-
C0671 0.1μ
IC0671
BA6417F
L.MOTOR DRIVE
OUT1
GND
VM
OUT2
Vcc
Vref
IN1
IN2
C0672 0.1μ
R0672 22k
R0671 680k
To CAPSTAN MOTOR
PG0602
HW-
HW+
HV-
HV+
HU-
HU+
Vout
Wout
H+
H-
Uout
FG Vcc
FG 1
FG GND
FG 2
R0666 2.2
C0660 0.1μ
R0665 2.2
C0659 0.1μ
R0664 2.2
C0658 0.1μ
C0657 0.47μ
C0656 0.1μ
C0655 0.1μ
R0667 39k
IC0651
LB1991V-TRM
CAPSTAN MOTOR DRIVE
ANGLE
VH-
VH+
W OUT
RF
V OUT
U OUT
NC
VS
(+B) Vcc2
(3V) Vcc1
GND
FRC
STANDBY
Uin1
Uin2
Vin1
Vin2
Win1
Win2
FGin+
FGin-
FGout
C0673 2200p
R0668 10k
R0662 1M
TL0660
To CYL.MOTOR
PG0603
U
V
W
CYL COM
DFG COM
DFG
IC0631
LB1950V-TRM
CYL.MOTOR DRIVE
U OUT
V OUT
STANDBY
BRAKE
FRC
VS
(+B) Vcc2
(3V) Vcc1
CSLP1
CSLP2
DPG OUT
DPGC
DPGin
Vref
DFGin
DFGin1
DFGin2
DFGout
OSC
FC
FILTER
RSAT2
RAST1
GND
W IN
U IN
V IN
COM
W OUT
RF
C0642 10μ/6.3
C0641 0.33μ
C0644 0.1μ
C0640 0.1μ
C0638 6800p
C0637 0.01μ
C0636 0.01μ
C0635 0.01μ
C0632 0.1μ
C0631 0.1μ
C0643 10μ/6.3
C0645 4700p
C0647 0.22μ
C0648 0.047μ
C0649 0.047μ
C0651 0.01μ
C0650 0.01μ
C0652 0.01μ
C0633 0.1μ
R0640 10k
R0641 10k
R0642 10k
R0643 0.47
R0644 0.47
R0681 1M
R0682 1M
To VIDEO PROCESS 1T
11L TRK.ADJ
14L S3V
2L HSW
1T ENVL
13L T.PROG
1L HSW
8L LOAD
7L UNLOAD
1K 5V
9K C.CONT
5L C.SPEED
R0691 1.8k
R0692 1.8k
R0693 1.8k
C0691 0.027μ
C0692 0.015μ
C0693 0.01μ
3K D.CONT
6L D.SPEED
R0694 5.6k
R0695 5.6k
R0696 5.6k
C0694 0.022μ
C0695 0.01μ
C0696 6800p
9L CFG
4L C.REV
12L C.STBY
8K C.VS
2K +B
3L D.STBY
7K D.VS
5K 3V
10L DFG
6K GND
4K GND (M)
To REGULATOR 1K-9K
To SYSTEM CONTROL 1L-14L
E
D
C
B
A
1
2
3
4
5
6
7
8

NOTE:ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

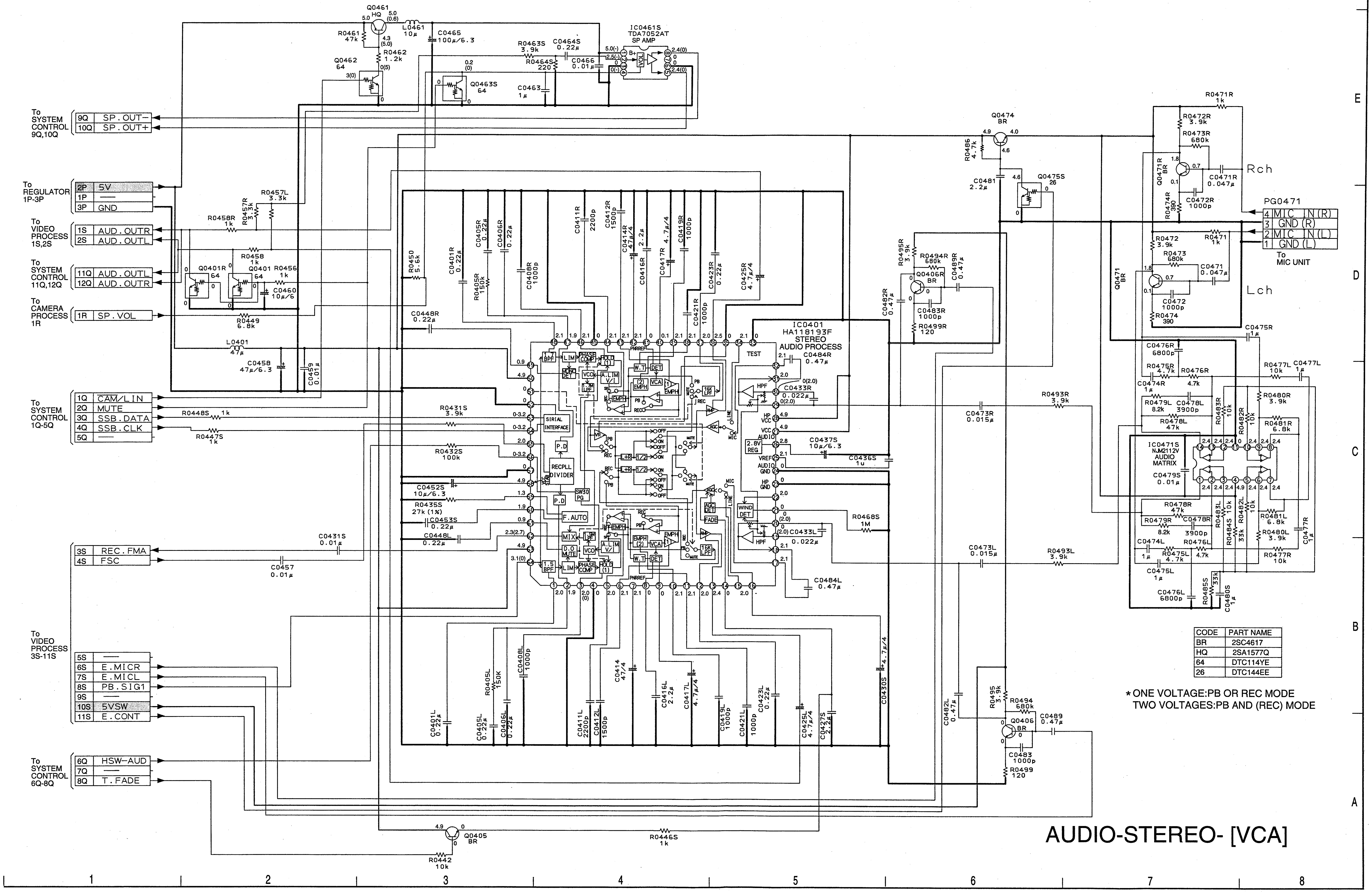
○— : WAVEFORMS No.

SERVO [VCA]

SERVO WAVEFORMS

1-A TL660 3.1Vp-p 1V/500μs REC/PLAY	2-A PG601-3 3.2Vp-p 0.5V/5ms REC/PLAY	3-B PG601-5 580mVp-p 0.2V/5ms PLAY	4-A PG601-7 3.2Vp-p 0.5V/5ms REC/PLAY
			

AUDIO -STEREO- [VCA] SCHEMATIC DIAGRAM [TYPE 765/665]



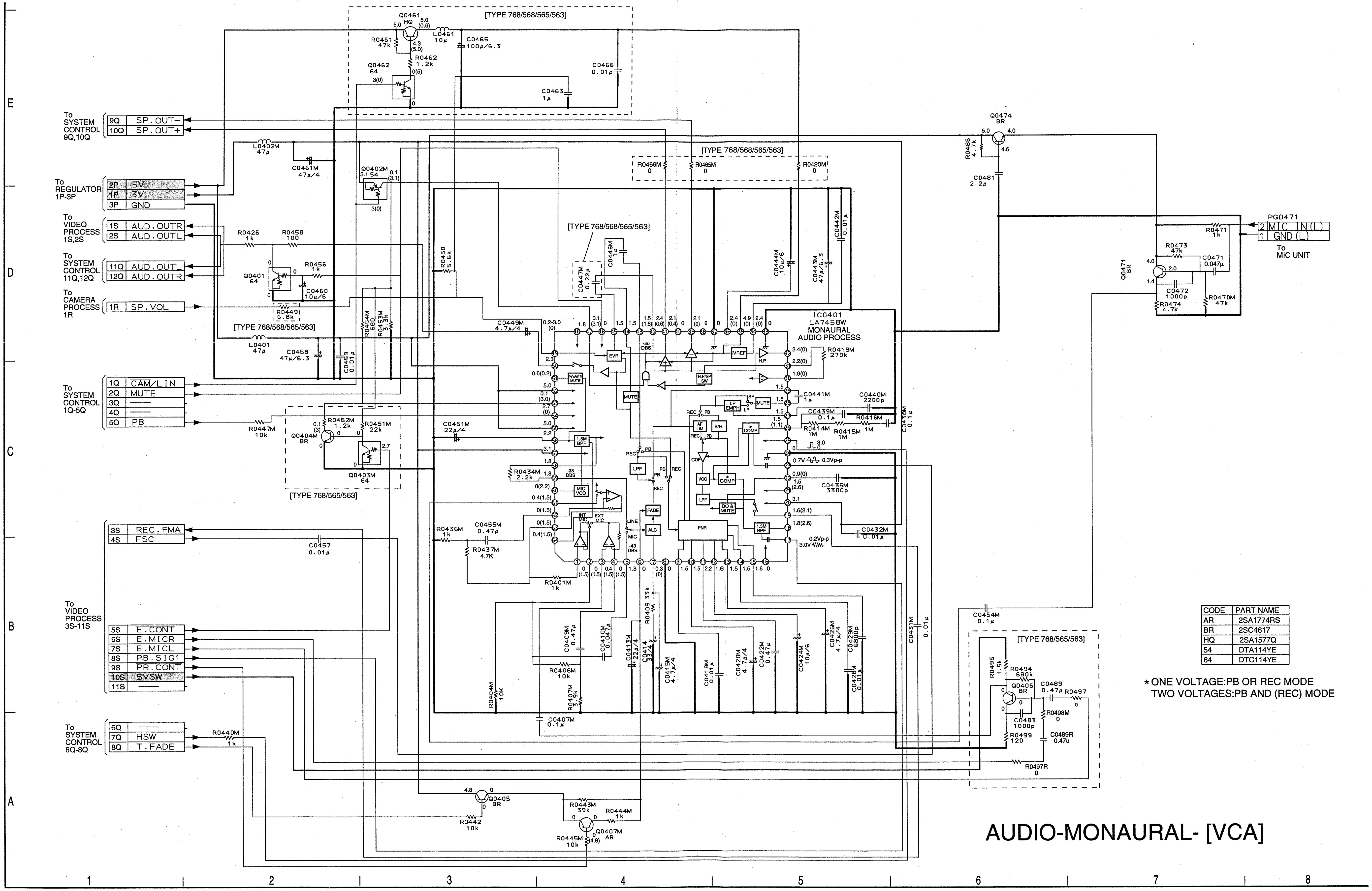
Q0461 HQ
L0461 10µ
C0465 100µ/6.3
R0461 47k
R0462 1.2k
Q0462 64
Q0463S 64
R0463S 3.9k
C0464S 0.22µ
R0464S 220
C0466 0.01µ
C0463 1µ
IC0461S TDA7052AT SP AMP
To SYSTEM CONTROL 9Q,10Q
9Q SP.OUT−
10Q SP.OUT+
To REGULATOR 1P-3P
2P 5V
1P —
3P GND
To VIDEO PROCESS 1S,2S
1S AUD.OUTR
2S AUD.OUTL
To SYSTEM CONTROL 11Q,12Q
11Q AUD.OUTL
12Q AUD.OUTR
To CAMERA PROCESS 1R
1R SP.VOL
R0458R 1k
R0457R 3.3k
R0457L 3.3k
R0458 1k
Q0401R 64
Q0401 64
R0456 1k
C0460 10µ/6
R0449 6.8k
L0401 47µ
C0458 47µ/6.3
C0459 0.01µ
To SYSTEM CONTROL 1Q-5Q
1Q CAM/LIN
2Q MUTE
3Q SSB.DATA
4Q SSB.CLK
5Q —
R0448S 1k
R0447S 1k
R0431S 3.9k
R0432S 100k
C0452S 10µ/6.3
R0435S 27k (1%)
C0453S 0.22µ
C0448L 0.22µ
C0448R 0.22µ
C0431S 0.01µ
3S REC.FMA
4S FSC
C0457 0.01µ
To VIDEO PROCESS 3S-11S
5S —
6S E.MICR
7S E.MICL
8S PB.SIG1
9S —
10S 5VSW
11S E.CONT
To SYSTEM CONTROL 6Q-8Q
6Q HSW-AUD
7Q —
8Q T.FADE
Q0405 BR
R0442 10k
R0446S 1k
R0450 5.6k
C0401R 0.22µ
C0405R 0.22µ
R0405R 150k
C0406R 0.22µ
C0408R 1000p
C0411R 2200p
C0412R 1500p
C0414R 47µ/4
C0416R 2.2µ
C0417R 4.7µ/4
C0419R 1000p
C0421R 1000p
C0423R 0.22µ
C0425R 4.7µ/4
IC0401 HA118193F STEREO AUDIO PROCESS
C0484R 0.47µ
C0433R 0.022µ
C0437S 10µ/6.3
C0436S 1u
R0468S 1M
C0433L 0.022µ
C0484L 0.47µ
C0401L 0.22µ
C0405L 0.22µ
R0405L 150K
C0406L 0.22µ
C0408L 1000p
C0411L 2200p
C0412L 1500p
C0414 47/4
C0416L 2.2µ
C0417L 4.7µ/4
C0419L 1000p
C0421L 1000p
C0423L 0.22µ
C0425L 4.7µ/4
C0427S 2.2µ
C0430S 4.7µ/4
BPF
LIM
PHASE COMP
HOLD
VCO
A.LIM V/I
MONO DET
LPF
EMPH
W.T
DET
VCA
SIRIAL INTERFACE
P.D
RECPLL DIVIDER
SW30 PG
F.AUTO
MIX
D.O MUTE
AGC
AGC DET
FADE
WIND DET
HPF
2.8V REG
TEST
MIC
LINE
MUTE
Q0474 BR
R0486 4.7k
C0481 2.2µ
Q0475S 26
R0495R 3.9k
R0494R 680k
Q0406R BR
C0489R 0.47µ
C0482R 0.47µ
C0483R 1000p
R0499R 120
C0473R 0.015µ
R0493R 3.9k
C0473L 0.015µ
R0493L 3.9k
C0482L 0.47µ
R0495 3.9k
R0494 680k
Q0406 BR
C0489 0.47µ
C0483 1000p
R0499 120
R0471R 1k
R0472R 3.9k
R0473R 680k
Q0471R BR
C0471R 0.047µ
R0474R 390
C0472R 1000p
Rch
PG0471
4 MIC IN(R)
3 GND(R)
2 MIC IN(L)
1 GND(L)
To MIC UNIT
R0472 3.9k
R0471 1k
R0473 680k
Q0471 BR
C0471 0.047µ
C0472 1000p
R0474 390
Lch
C0475R 1µ
C0476R 6800p
R0475R 4.7k
R0476R 4.7k
C0474R 1µ
R0477L 10k
C0477L 1µ
R0479L 8.2k
C0478L 3900p
R0478L 47k
R0483R 10k
R0482R 10k
R0480R 3.9k
R0481R 6.8k
IC0471S NJM2112V AUDIO MATRIX
C0479S 0.01µ
R0478R 47k
R0479R 8.2k
C0478R 3900p
R0484S 33k
R0483L 10k
R0482L 10k
R0481L 6.8k
R0480L 3.9k
C0477R 1µ
R0477R 10k
C0474L 1µ
R0475L 4.7k
R0476L 4.7k
C0475L 1µ
C0476L 6800p
R0485S 33k
C0480S 1µ

CODE	PART NAME
BR	2SC4617
HQ	2SA1577Q
64	DTC114YE
26	DTC144EE

*ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

AUDIO-STEREO- [VCA]

AUDIO -MONAURAL- [VCA] SCHEMATIC DIAGRAM [TYPE 768/660/568/565/563/368/360]

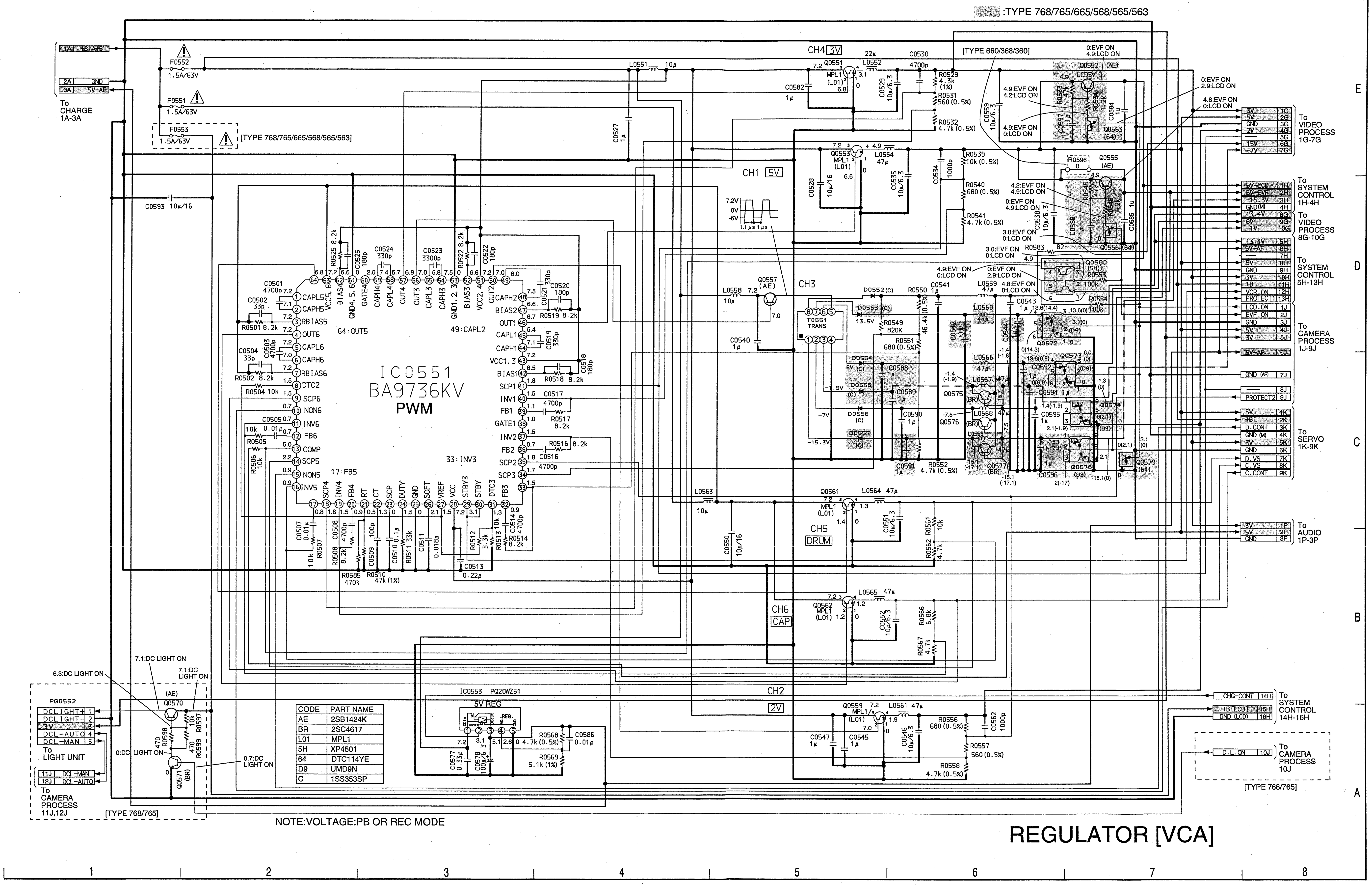

E
D
C
B
A
1
2
3
4
5
6
7
8
[TYPE 768/568/565/563]
Q0461 HQ
R0461 47k
L0461 10µ
C0465 100µ/6.3
R0462 1.2k
Q0462 64
C0466 0.01µ
C0463 1µ
To SYSTEM CONTROL 9Q,10Q
9Q SP.OUT−
10Q SP.OUT+
L0402M 47µ
C0461M 47µ/4
Q0402M 54
To REGULATOR 1P-3P
2P 5V
1P 3V
3P GND
To VIDEO PROCESS 1S,2S
1S AUD.OUTR
2S AUD.OUTL
To SYSTEM CONTROL 11Q,12Q
11Q AUD.OUTL
12Q AUD.OUTR
To CAMERA PROCESS 1R
1R SP.VOL
R0426 1k
R0458 100
R0456 1k
Q0401 64
C0460 10µ/6
R0449 6.8k
[TYPE 768/568/565/563]
L0401 47µ
C0458 47µ/6.3
C0459 0.01µ
R0450 5.6k
R0454M 680
R0453M 3.3k
C0449M 4.7µ/4
[TYPE 768/568/565/563]
R0466M 0
R0465M 0
R0420M 0
C0446M 1µ
C0447M 0.22µ
C0444M 10µ/6
C0443M 47µ/6.3
C0442M 0.01µ
IC0401 LA7458W MONAURAL AUDIO PROCESS
R0419M 270k
EVR
VREF
H.P
POWER MUTE
MUTE
H.P/SP SW
LP EMPH
SP
LP
AF LIM
S/H
COMP
REC
PB
LPF
VCO
DO & MUTE
FADE
ALC
PNR
1.5M BPF
MIC VCO
INT MIC
EXT MIC
LINE
MIC
C0441M 1µ
C0440M 2200p
C0439M 0.1µ
R0416M 1M
R0414M 1M
R0415M 1M
C0438M 0.1µ
0.7V 0.3Vp-p
C0435M 3300p
C0432M 0.01µ
0.2Vp-p
3.0V
To SYSTEM CONTROL 1Q-5Q
1Q CAM/LIN
2Q MUTE
3Q ——
4Q ——
5Q PB
R0447M 10k
Q0404M BR
R0452M 1.2k
R0451M 22k
Q0403M 64
[TYPE 768/565/563]
C0451M 22µ/4
R0434M 2.2k
3S REC.FMA
4S FSC
C0457 0.01µ
R0436M 1k
C0455M 0.47µ
R0437M 4.7K
R0401M 1k
To VIDEO PROCESS 3S-11S
5S E.CONT
6S E.MICR
7S E.MICL
8S PB.SIG1
9S PR.CONT
10S 5VSW
11S ——
C0409M 0.47µ
C0410M 0.047µ
R0409 33k
C0413M 22µ/4
C0414 33µ/4
C0415M 4.7µ/4
C0418M 0.01µ
C0420M 4.7µ/4
C0422M 0.47µ
C0424M 10µ/6
C0425M 4.7µ/4
C0429M 6800p
C0428M 0.01µ
C0431M 0.01µ
R0406M 10k
R0407M 3.9k
R0404M 10K
C0407M 0.1µ
To SYSTEM CONTROL 6Q-8Q
6Q ——
7Q HSW
8Q T.FADE
R0440M 1k
Q0405 BR
R0442 10k
R0443M 39k
R0444M 1k
Q0407M AR
R0445M 10k
Q0474 BR
R0486 4.7k
C0481 2.2µ
PG0471
2 MIC IN(L)
1 GND(L)
To MIC UNIT
R0471 1k
R0473 47k
C0471 0.047µ
Q0471 BR
C0472 1000p
R0474 4.7k
R0470M 47k
C0454M 0.1µ
[TYPE 768/565/563]
R0495 1.5k
R0494 680k
Q0406 BR
C0489 0.47µ
R0497 0
R0498M 0
C0483 1000p
R0499 120
C0489R 0.47u
R0497R 0

CODE	PART NAME
AR	2SA1774RS
BR	2SC4617
HQ	2SA1577Q
54	DTA114YE
64	DTC114YE

*ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

AUDIO-MONAURAL- [VCA]

REGULATOR [VCA] SCHEMATIC DIAGRAM


:TYPE 768/765/665/568/565/563
To CHARGE 1A-3A
+B[A+B]
GND
5V-AF
F0552 1.5A/63V
F0551 1.5A/63V
F0553 1.5A/63V
[TYPE 768/765/665/568/565/563]
C0593 10µ/16
IC0551 BA9736KV
PWM
64:OUT5
49:CAPL2
17:FB5
33:INV3
CH1 5V
CH2 2V
CH3
CH4 3V
CH5 DRUM
CH6 CAP
[TYPE 660/368/360]
T0551 TRANS
IC0553 PQ20WZ51
5V REG
Q0551 MPL1 (L01)
Q0553 MPL1 (L01)
Q0557 (AE)
Q0559 MPL1 (L01)
Q0561 MPL1 (L01)
Q0562 MPL1 (L01)
Q0570 (AE)
Q0571 (BR)
PG0552
DCLIGHT+ 1
DCLIGHT- 2
3V 3
DCL-AUTO 4
DCL-MAN 5
To LIGHT UNIT
11J DCL-MAN
12J DCL-AUTO
To CAMERA PROCESS 11J,12J
[TYPE 768/765]
6.3:DC LIGHT ON
7.1:DC LIGHT ON
0:DC LIGHT ON
0.7:DC LIGHT ON
To VIDEO PROCESS 1G-7G
To SYSTEM CONTROL 1H-4H
To VIDEO PROCESS 8G-10G
To SYSTEM CONTROL 5H-13H
To CAMERA PROCESS 1J-9J
To SERVO 1K-9K
To AUDIO 1P-3P
To SYSTEM CONTROL 14H-16H
CHG-CONT 14H
+B[LCD] 15H
GND (LCD) 16H
To CAMERA PROCESS 10J
D.L.ON 10J
[TYPE 768/765]
E
D
C
B
A
1
2
3
4
5
6
7
8

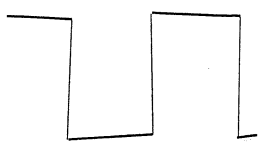
CODE	PART NAME
AE	2SB1424K
BR	2SC4617
L01	MPL1
5H	XP4501
64	DTC114YE
D9	UMD9N
C	1SS353SP

NOTE:VOLTAGE:PB OR REC MODE

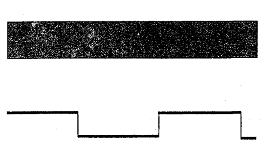
REGULATOR [VCA]

VIDEO PROCESS WAVEFORMS

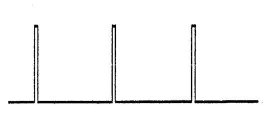
1-A TL107 3.2Vp-p
0.5V/5ms
REC/PLAY



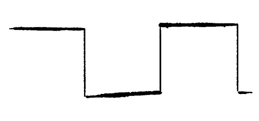
2-B TL108 320mVp-p
0.2V/5ms
PLAY



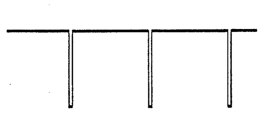
3-A TL205 3.0Vp-p
1V/5ms
REC



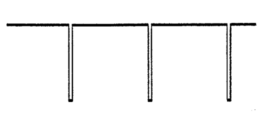
4-A TL207 3.1Vp-p
1V/5ms
REC



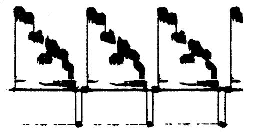
5-A TL208 3.0Vp-p
1V/5ms
REC



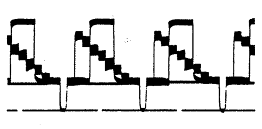
6-A TL209 3.0Vp-p
1V/20µs
REC



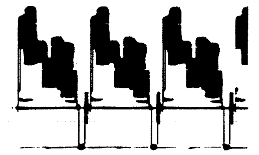
7-A TL216 1.0Vp-p
0.2V/20µs
REC



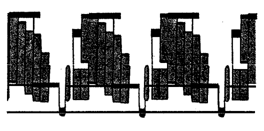
7-B TL216 1.1Vp-p
0.2V/20µs
PLAY



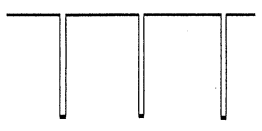
8-A TL232 1.2Vp-p
0.2V/20µs
REC



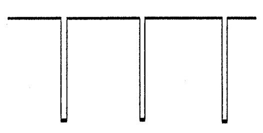
8-B TL232 1.0 Vp-p
0.2V/20µs
PLAY



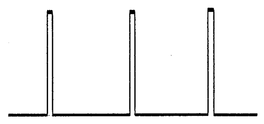
9-A TL246 7.5Vp-p
2V/20µs
REC



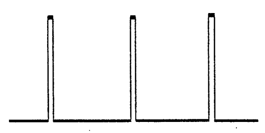
10-A TL247 7.5Vp-p
2V/20µs
REC



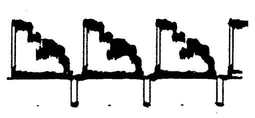
11-A TL248 7.5Vp-p
2V/20µs
REC



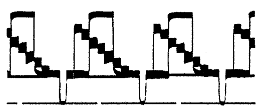
12-A TL249 7.5Vp-p
2V/20µs
REC



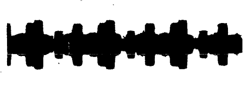
13-A TL265 1.8Vp-p
0.5V/20µs
REC



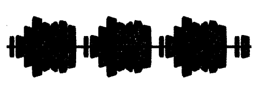
13-B TL265 1.9Vp-p
0.5V/20µs
PLAY



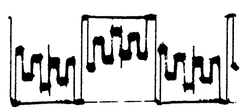
14-A TL280 1.1Vp-p
0.5V/20µs
REC



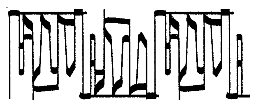
14-B TL280 1.3Vp-p
0.5V/20µs
PLAY



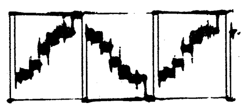
15-A TL351 3.8Vp-p
1V/20µs
REC



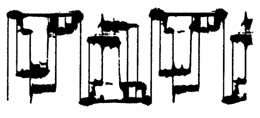
15-B TL351 4.0Vp-p
1V/20µs
PLAY



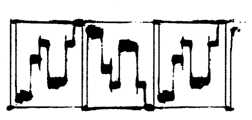
16-A TL352 3.8Vp-p
1V/20µs
REC



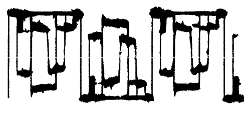
16-B TL352 4.0Vp-p
1V/20µs
PLAY



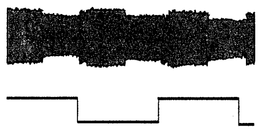
17-A TL353 3.8Vp-p
1V/20µs
REC



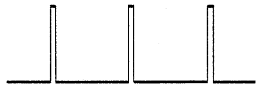
17-B TL353 4.0Vp-p
1V/20µs
PLAY



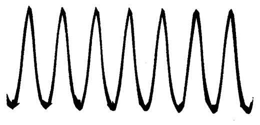
18-B IC101-27 200mVp-p
0.1V/5ms
PLAY



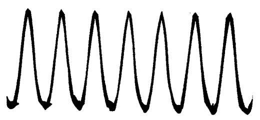
19-A IC202-17 3.0Vp-p
1V/20µs
REC



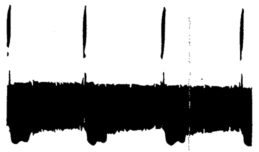
20-A IC202-18 3.0Vp-p
1V/50ns
REC



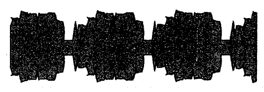
21-A IC202-19 3.0Vp-p
1V/50ns
REC



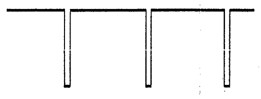
22-A IC202-27 1.1Vp-p
0.2V/20µs
REC



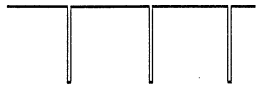
23-B IC202-29 400mVp-p
0.2V/20µs
PLAY



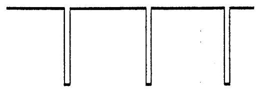
24-A IC203-7 3.0Vp-p
1V/20µs
REC



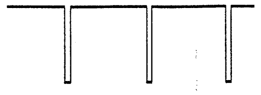
25-A IC203-8 3.0 Vp-p
1V/5ms
REC



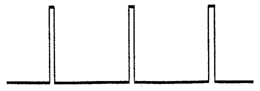
26-A IC203-9 3.0Vp-p
1V/20µs
REC



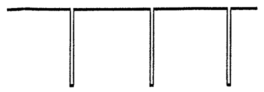
27-A IC203-10 3.0Vp-p
1V/20µs
REC



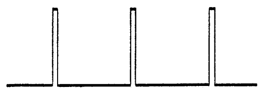
28-A IC203-12 3.0Vp-p
1V/20µs
REC



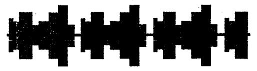
29-A IC203-13 3.0Vp-p
1V/5ms
REC



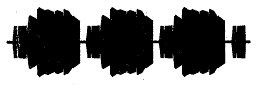
30-A IC203-14 3.0Vp-p
1V/20µs
REC



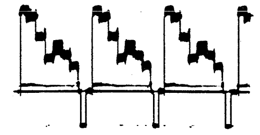
31-A IC301-14 270mVp-p
0.1V/20µs
REC



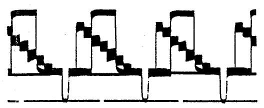
31-B IC301-14 310mVp-p
0.1V/20µs
PLAY



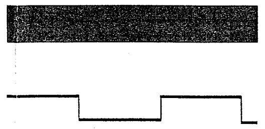
32-A IC301-21 520mVp-p
0.1V/20µs
REC



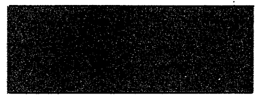
32-B IC301-21 540mVp-p
0.1V/20µs
PLAY



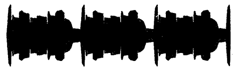
33-B Q110-E 1.7Vp-p
1V/5ms
PLAY



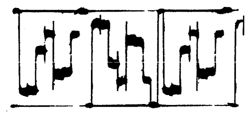
34-A Q202-E 400mVp-p
0.1V/20µs
REC



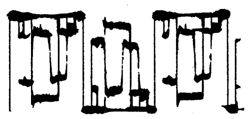
35-A Q209-E 150mVp-p
50mV/20µs
REC



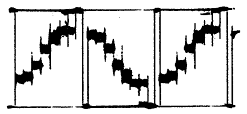
36-A Q350-B 2.1Vp-p
0.5V/20µs
REC



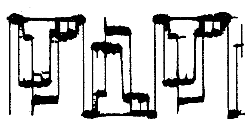
36-B Q350-B 2.1Vp-p
0.5V/20µs
PLAY



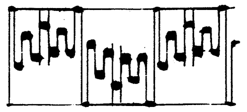
37-A Q351-B 2.1Vp-p
0.5V/20µs
REC



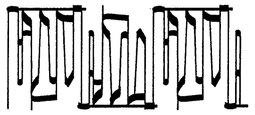
37-B Q351-B 2.1Vp-p
0.5V/20µs
PLAY



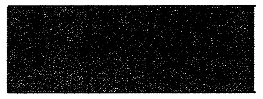
38-A Q352-B 2.1Vp-p
0.5V/20µs
REC



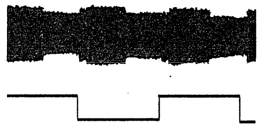
38-B Q352-B 2.1Vp-p
0.5V/20µs
PLAY



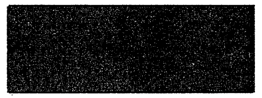
39-A C209 240mVp-p
50mV/20µs
REC/PLAY



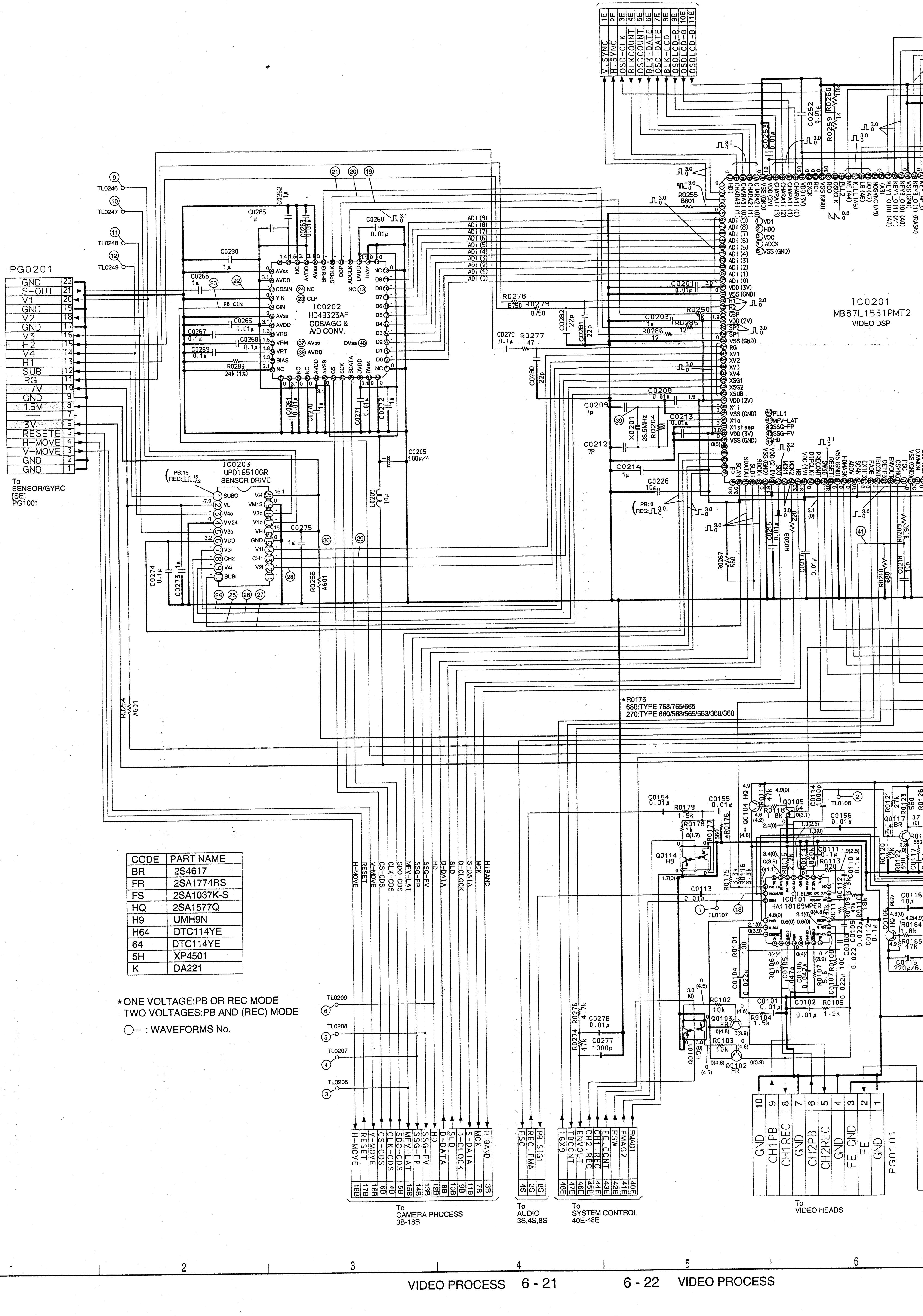
40-B R156 1.5Vp-p
0.5V/5ms
PLAY



41-A R210 430mVp-p
0.1V/20µs
REC/PLAY



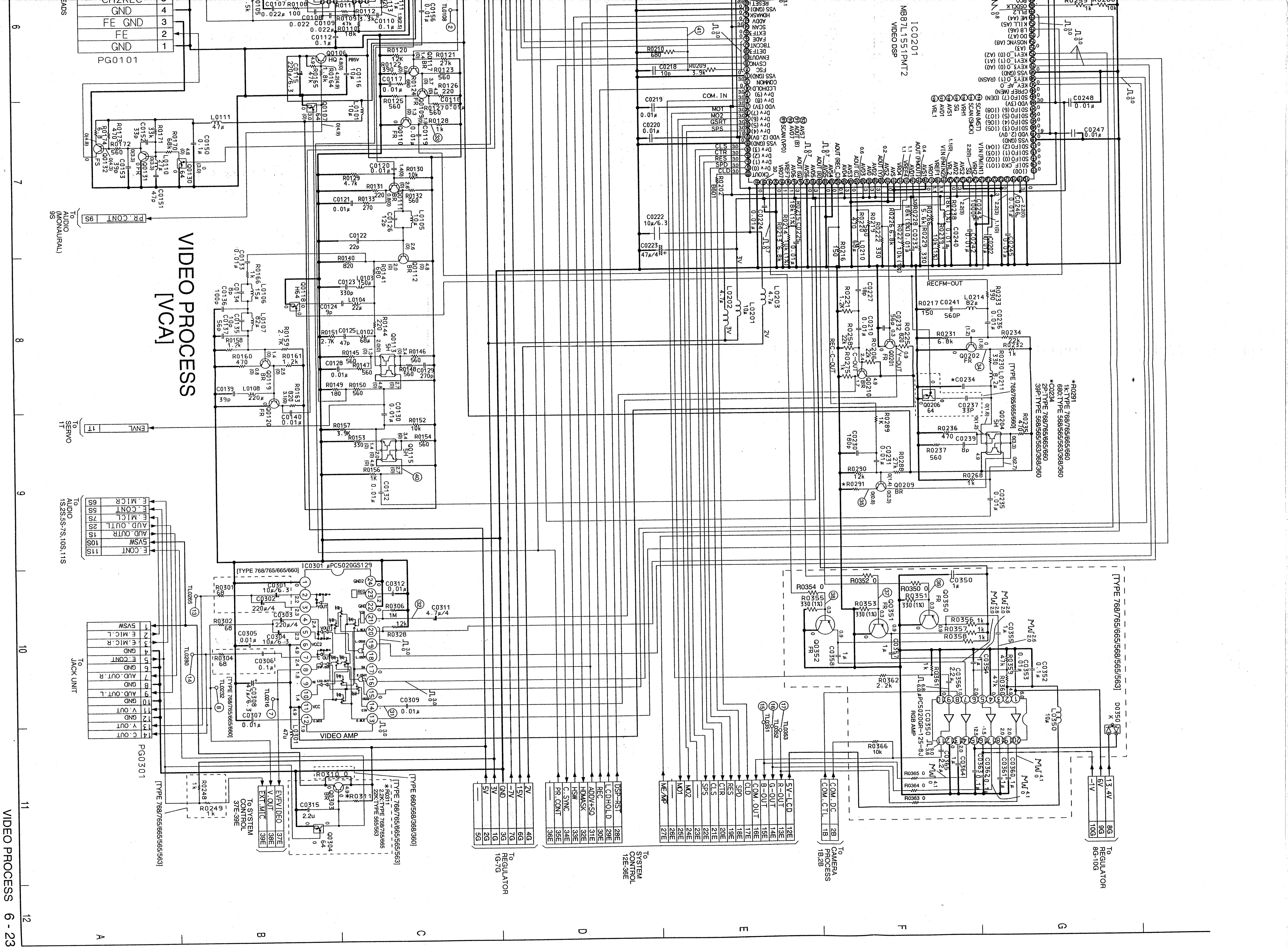
VIDEO PROCESS [VCA] SCHEMATIC DIAGRAM


To SYSTEM CONTROL 1E-11E
V.SYNC 1E
H.SYNC 2E
OSD-CLK 3E
BLKCOUNT 4E
OSDCOUNT 5E
BLK-DATE 6E
OSD-DATE 7E
BLK-LCD 8E
OSDLCD-R 9E
OSDLCD-G 10E
OSDLCD-B 11E
PG0201
GND 22
S-OUT 21
V1 20
GND 19
V2 18
GND 17
V3 16
H2 15
V4 14
H1 13
SUB 12
RG 11
-7V 10
GND 9
15V 8
— 7
3V 6
RESETE 5
H-MOVE 4
V-MOVE 3
GND 2
GND 1
To SENSOR/GYRO [SE] PG1001
TL0246
TL0247
TL0248
TL0249
IC0202
HD49323AF
CDS/AGC &
A/D CONV.
IC0203
UPD16510GR
SENSOR DRIVE
IC0201
MB87L1551PMT2
VIDEO DSP
IC0101
HA118189MPER
X0201
28.5MHz
*R0176
680:TYPE 768/765/665
270:TYPE 660/568/565/563/368/360
To CAMERA PROCESS 3B-18B
HIBAND 3B
MCK 7B
S-DATA 11B
D-CLOCK 9B
SLD 10B
D-DATA 8B
HD 12B
SSG-FV 13B
SSG-FP 14B
MFV-LAT 15B
SDO-CDS 5B
CLK-CDS 4B
CS-CDS 6B
V-MOVE 16B
RESET 17B
H-MOVE 18B
To AUDIO 3S,4S,8S
PB.SIG1 8S
REC.FMA 3S
FSC 4S
To SYSTEM CONTROL 40E-48E
FMAG1 40E
FMAG2 41E
HSW 42E
FE.CONT 43E
CH1.REC 44E
CH2.REC 45E
ENVOUT 46E
TBCCNT 47E
16X9 48E
TL0209
TL0208
TL0207
TL0205
TL0107
TL0108
PG0101
GND 10
CH1PB 9
CH1REC 8
GND 7
CH2PB 6
CH2REC 5
GND 4
FE GND 3
FE 2
GND 1
To VIDEO HEADS
1
2
3
4
5
6

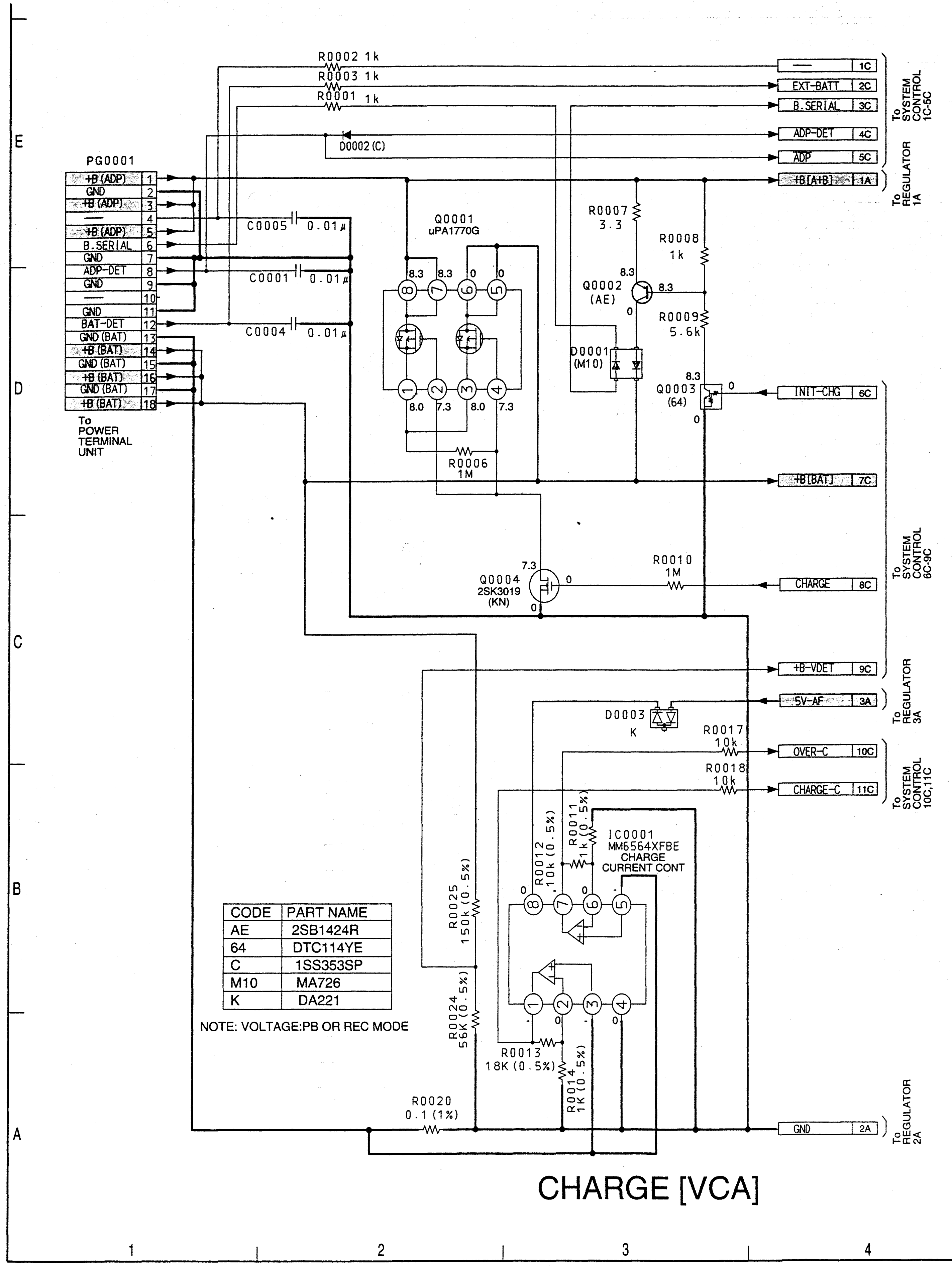
CODE	PART NAME
BR	2S4617
FR	2SA1774RS
FS	2SA1037K-S
HQ	2SA1577Q
H9	UMH9N
H64	DTC114YE
64	DTC114YE
5H	XP4501
K	DA221

*ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

○ : WAVEFORMS No.


VIDEO PROCESS [VCA]
IC0201 MB87L1551PMT2 VIDEO DSP
IC0301 μPC5020GS129
VIDEO AMP
IC0350 μPC5020GR-125-8 RGB AMP
PG0101
PG0301
GND
FE GND
FE
To AUDIO (MONAURAL) 9S
PR.CONT
To SERVO 1T
ENVL
To AUDIO 1S,2S,5S-7S,10S,11S
E.MIC.R
E.CONT
E.MIC.L
AUD.OUT.L
AUD.OUT.R
SVSW
To JACK UNIT
V.OUT
Y.OUT
C.OUT
To SYSTEM CONTROL 37E-39E
EVF VIDEO
V.OUT
EXT.MIC
To REGULATOR 1G-7G
5V
3V
GND
-7V
15V
2V
To SYSTEM CONTROL 12E-36E
DSP-RST
LCDHOLD
REC
ADDV+SQ
HDMASK
HSW
C.SYNC
PR.CONT
ME/MP
MO1
MO2
SPS
CLS
CTR
RES
SPD
CLD
COM.OUT
B-OUT
G-OUT
R-OUT
5V-LCD
To CAMERA PROCESS 1B,2B
COM.DC
COM.CTL
To REGULATOR 8G-10G
13.4V
6V
-1V
[TYPE 768/765/665/660]
[TYPE 768/765/665/565/563]
[TYPE 768/765/665/568/565/563]
[TYPE 660/568/368/360]
RECFM-OUT
REC-C-OUT
COM. IN
*R0291 1k:TYPE 768/765/665/660 680:TYPE 568/565/563/368/360
*C0234 2P:TYPE 768/765/665/660 39P:TYPE 568/565/563/368/360

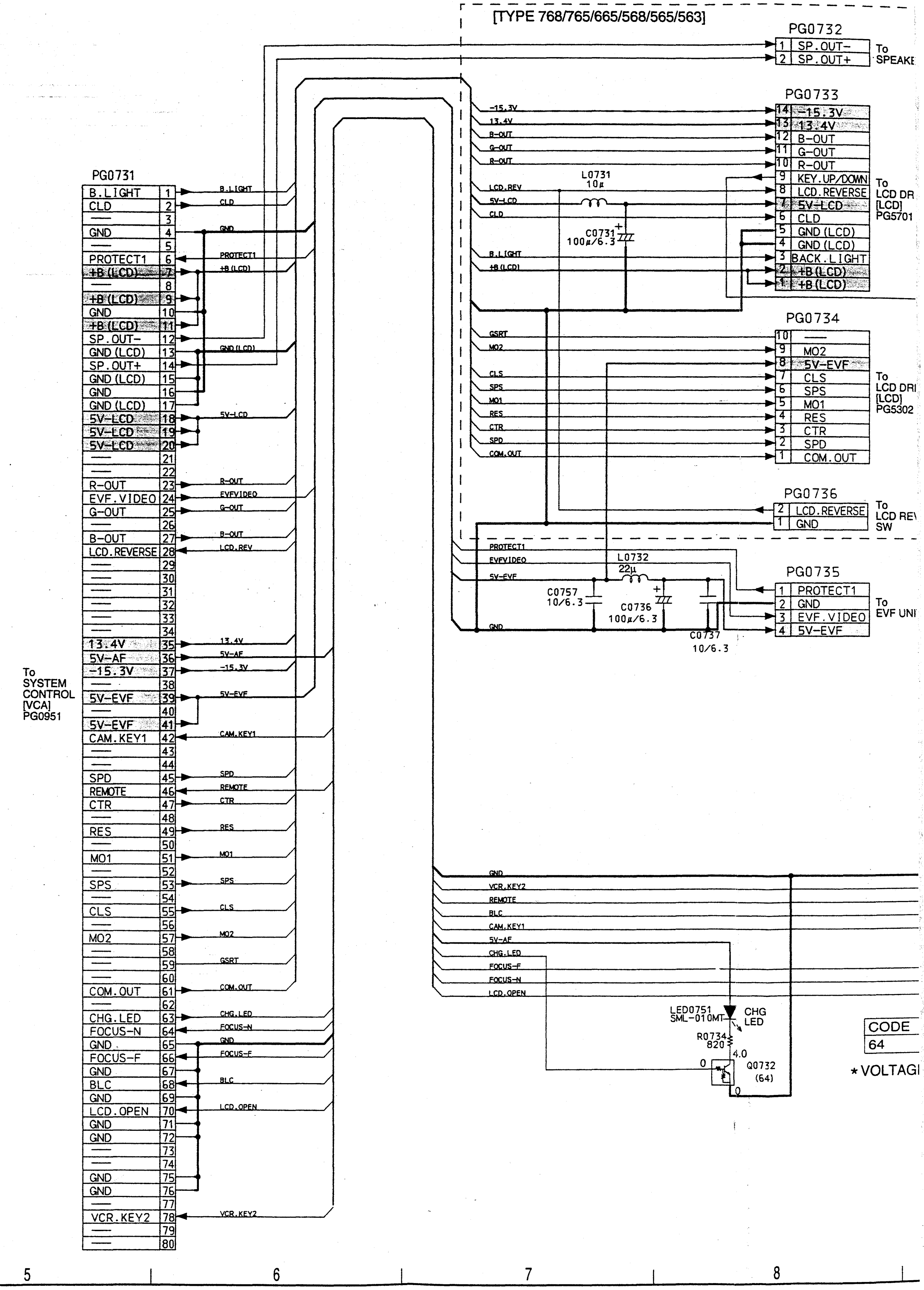
CHARGE [VCA] SCHEMATIC DIAGRAM


PG0001
+B (ADP)
GND
+B (ADP)
+B (ADP)
B.SERIAL
GND
ADP-DET
GND
GND
BAT-DET
GND (BAT)
+B (BAT)
GND (BAT)
+B (BAT)
GND (BAT)
+B (BAT)
To POWER TERMINAL UNIT
R0002 1k
R0003 1k
R0001 1k
D0002 (C)
C0005 0.01μ
C0001 0.01μ
C0004 0.01μ
Q0001 uPA1770G
R0006 1M
R0007 3.3
R0008 1k
Q0002 (AE)
R0009 5.6k
D0001 (M10)
Q0003 (64)
Q0004 2SK3019 (KN)
R0010 1M
D0003 K
R0017 10k
R0018 10k
IC0001 MM6564XFBE CHARGE CURRENT CONT
R0012 10k (0.5%)
R0011 1k (0.5%)
R0025 150k (0.5%)
R0024 56K (0.5%)
R0013 18K (0.5%)
R0014 1K (0.5%)
R0020 0.1 (1%)
EXT-BATT 2C
B.SERIAL 3C
ADP-DET 4C
ADP 5C
+B[A+B] 1A
INIT-CHG 6C
+B[BAT] 7C
CHARGE 8C
+B-VDET 9C
5V-AF 3A
OVER-C 10C
CHARGE-C 11C
GND 2A
To SYSTEM CONTROL 1C-5C
To REGULATOR 1A
To SYSTEM CONTROL 6C-9C
To REGULATOR 3A
To SYSTEM CONTROL 10C,11C
To REGULATOR 2A
CHARGE [VCA]

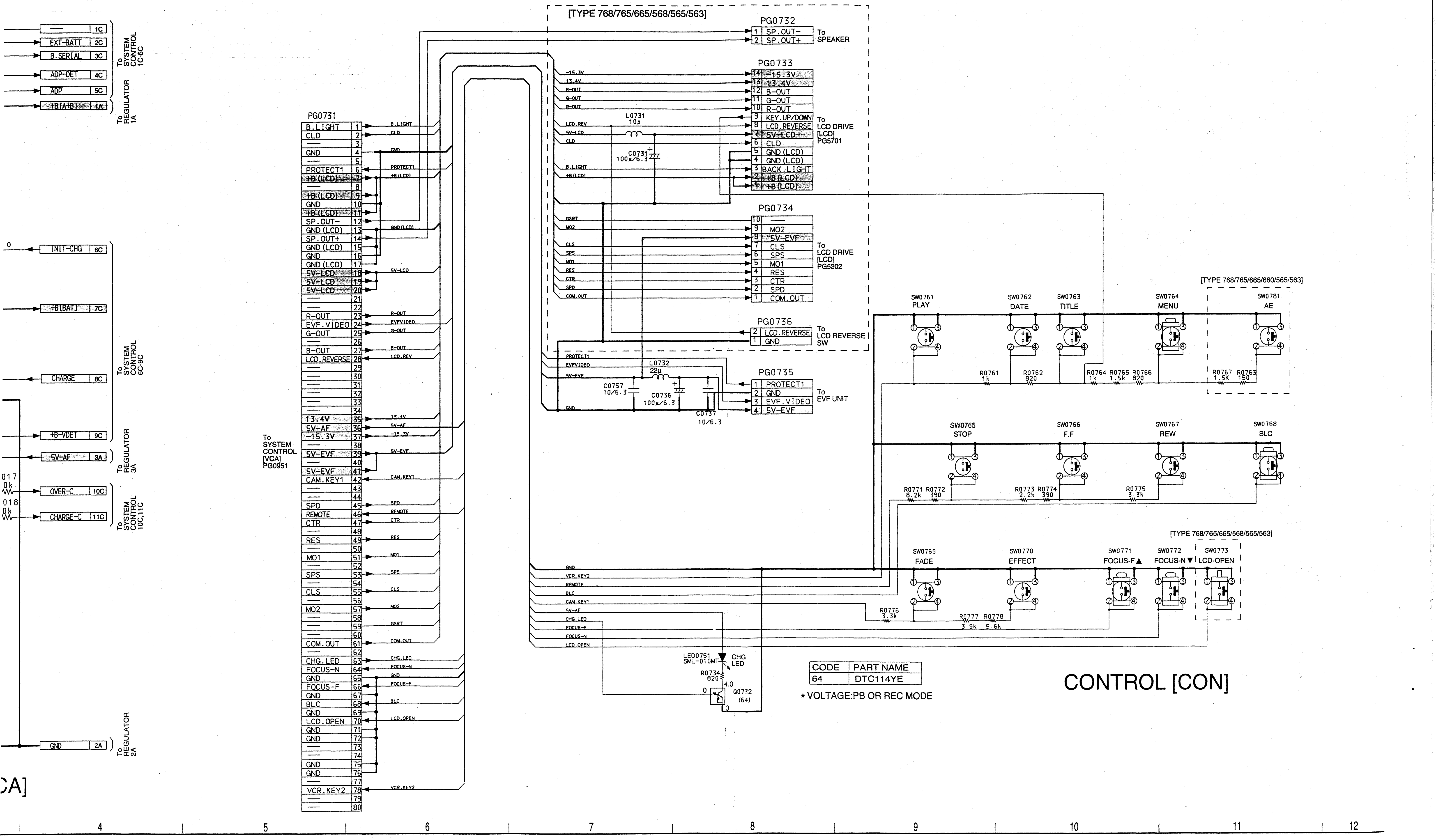
CODE	PART NAME
AE	2SB1424R
64	DTC114YE
C	1SS353SP
M10	MA726
K	DA221

NOTE: VOLTAGE:PB OR REC MODE

CONTROL [CON] SCHEMATIC DIAGRAM


[TYPE 768/765/665/568/565/563]
PG0731
To SYSTEM CONTROL [VCA] PG0951
B.LIGHT
CLD
GND
PROTECT1
+B (LCD)
+B (LCD)
GND
+B (LCD)
SP.OUT-
GND (LCD)
SP.OUT+
GND (LCD)
GND
GND (LCD)
5V-LCD
5V-LCD
5V-LCD
R-OUT
EVF.VIDEO
G-OUT
B-OUT
LCD.REVERSE
13.4V
5V-AF
-15.3V
5V-EVF
5V-EVF
CAM.KEY1
SPD
REMOTE
CTR
RES
MO1
SPS
CLS
MO2
COM.OUT
CHG.LED
FOCUS-N
GND
FOCUS-F
GND
BLC
GND
LCD.OPEN
GND
GND
GND
GND
VCR.KEY2
PG0732
SP.OUT-
SP.OUT+
To SPEAKE
PG0733
-15.3V
13.4V
B-OUT
G-OUT
R-OUT
KEY.UP/DOWN
LCD.REVERSE
5V-LCD
CLD
GND (LCD)
GND (LCD)
BACK.LIGHT
+B (LCD)
+B (LCD)
To LCD DR [LCD] PG5701
L0731 10μ
C0731 100μ/6.3
PG0734
MO2
5V-EVF
CLS
SPS
MO1
RES
CTR
SPD
COM.OUT
To LCD DRI [LCD] PG5302
PG0736
LCD.REVERSE
GND
To LCD REV SW
L0732 22μ
C0757 10/6.3
C0736 100μ/6.3
C0737 10/6.3
PG0735
PROTECT1
GND
EVF.VIDEO
5V-EVF
To EVF UNI
LED0751 SML-010MT
CHG LED
R0734 820
Q0732 (64)
CODE
64
★VOLTAGI

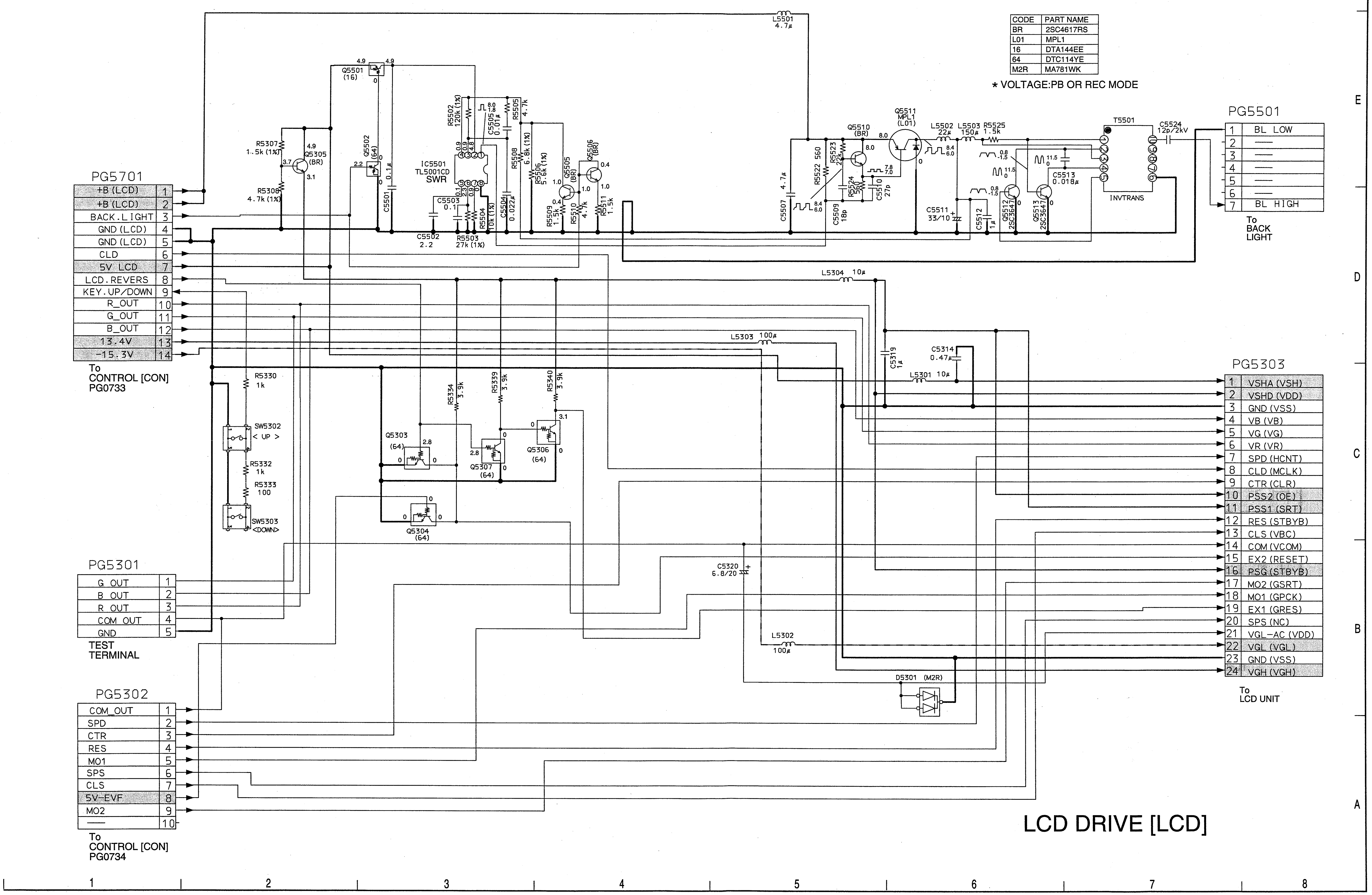
CONTROL [CON] SCHEMATIC DIAGRAM


[TYPE 768/765/665/568/565/563]
PG0732
SP.OUT-
SP.OUT+
To SPEAKER
PG0733
-15.3V
13.4V
B-OUT
G-OUT
R-OUT
KEY.UP/DOWN
LCD.REVERSE
5V-LCD
CLD
GND (LCD)
BACK.LIGHT
+B(LCD)
To LCD DRIVE [LCD] PG5701
L0731 10µ
C0731 100µ/6.3
PG0734
MO2
5V-EVF
CLS
SPS
MO1
RES
CTR
SPD
COM.OUT
To LCD DRIVE [LCD] PG5302
PG0736
LCD.REVERSE
GND
To LCD REVERSE SW
PG0735
PROTECT1
GND
EVF.VIDEO
5V-EVF
To EVF UNIT
L0732 22µ
C0757 10/6.3
C0736 100µ/6.3
C0737 10/6.3
PG0731
B.LIGHT
CLD
GND
PROTECT1
+B(LCD)
SP.OUT-
GND (LCD)
SP.OUT+
5V-LCD
R-OUT
EVF.VIDEO
G-OUT
B-OUT
LCD.REVERSE
13.4V
5V-AF
-15.3V
5V-EVF
CAM.KEY1
SPD
REMOTE
CTR
RES
MO1
SPS
CLS
MO2
COM.OUT
CHG.LED
FOCUS-N
FOCUS-F
BLC
LCD.OPEN
VCR.KEY2
To SYSTEM CONTROL [VCA] PG0951
EXT-BATT
B.SERIAL
ADP-DET
ADP
+B[A+B]
To SYSTEM CONTROL 1C-5C
To REGULATOR 1A
INIT-CHG
+B[BAT]
CHARGE
To SYSTEM CONTROL 6C-9C
+B-VDET
5V-AF
To REGULATOR 3A
OVER-C
CHARGE-C
To SYSTEM CONTROL 10C,11C
GND
To REGULATOR 2A
CA]
SW0761 PLAY
SW0762 DATE
SW0763 TITLE
SW0764 MENU
[TYPE 768/765/665/660/565/563]
SW0781 AE
R0761 1k
R0762 820
R0764 1k
R0765 1.5k
R0766 820
R0767 1.5K
R0763 150
SW0765 STOP
SW0766 F.F
SW0767 REW
SW0768 BLC
R0771 8.2k
R0772 390
R0773 2.2k
R0774 390
R0775 3.3k
[TYPE 768/765/665/568/565/563]
SW0769 FADE
SW0770 EFFECT
SW0771 FOCUS-F▲
SW0772 FOCUS-N▼
SW0773 LCD-OPEN
R0776 3.3k
R0777 3.9k
R0778 5.6k
LED0751 SML-010MT
CHG LED
R0734 820
Q0732 (64)
4.0
0
CONTROL [CON]
4
5
6
7
8
9
10
11
12

CODE	PART NAME
64	DTC114YE

*VOLTAGE:PB OR REC MODE

LCD DRIVE [LCD] SCHEMATIC DIAGRAM



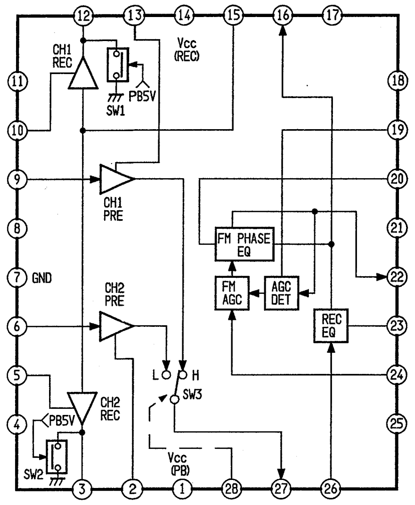
CODE	PART NAME
BR	2SC4617RS
L01	MPL1
16	DTA144EE
64	DTC114YE
M2R	MA781WK

* VOLTAGE:PB OR REC MODE

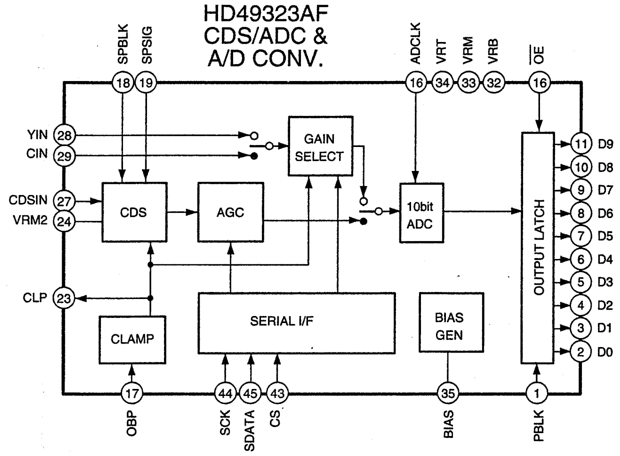
PG5701
1 +B (LCD)
2 +B (LCD)
3 BACK.LIGHT
4 GND (LCD)
5 GND (LCD)
6 CLD
7 5V LCD
8 LCD.REVERS
9 KEY.UP/DOWN
10 R_OUT
11 G_OUT
12 B_OUT
13 13.4V
14 -15.3V
To CONTROL [CON] PG0733
PG5301
1 G OUT
2 B OUT
3 R OUT
4 COM OUT
5 GND
TEST TERMINAL
PG5302
1 COM_OUT
2 SPD
3 CTR
4 RES
5 MO1
6 SPS
7 CLS
8 5V-EVF
9 MO2
10 —
To CONTROL [CON] PG0734
PG5501
1 BL LOW
2 —
3 —
4 —
5 —
6 —
7 BL HIGH
To BACK LIGHT
PG5303
1 VSHA (VSH)
2 VSHD (VDD)
3 GND (VSS)
4 VB (VB)
5 VG (VG)
6 VR (VR)
7 SPD (HCNT)
8 CLD (MCLK)
9 CTR (CLR)
10 PSS2 (OE)
11 PSS1 (SRT)
12 RES (STBYB)
13 CLS (VBC)
14 COM (VCOM)
15 EX2 (RESET)
16 PSG (STBYB)
17 MO2 (GSRT)
18 MO1 (GPCK)
19 EX1 (GRES)
20 SPS (NC)
21 VGL-AC (VDD)
22 VGL (VGL)
23 GND (VSS)
24 VGH (VGH)
To LCD UNIT
L5501 4.7µ
Q5501 (16)
R5307 1.5k (1%)
Q5305 (BR)
R5308 4.7k (1%)
Q5502 (64)
C5501 0.1µ
R5502 120k (1%)
C5505 0.01µ
R5505 4.7k
IC5501 TL5001CD SWR
C5503 0.1
C5502 2.2
R5503 27k (1%)
R5504 10k (1%)
C5504 0.022µ
R5508 6.8k (1%)
R5506 5.6k (1%)
R5509 1.5k
R5510 4.7k
R5511 1.5k
Q5505 (BR)
Q5506 (BR)
C5507 4.7µ
R5522 560
R5523 22k
R5524 560
C5509 18p
C5510 27p
Q5510 (BR)
Q5511 MPL1 (L01)
L5502 22µ
L5503 150µ
R5525 1.5k
C5511 33/10
C5512 1µ
Q5512 2SC3647
Q5513 2SC3647
C5513 0.018µ
T5501
INVTRANS
C5524 12p/2kV
L5304 10µ
L5303 100µ
C5319 1µ
C5314 0.47µ
L5301 10µ
R5330 1k
SW5302 < UP >
R5332 1k
R5333 100
SW5303 <DOWN>
Q5303 (64)
Q5304 (64)
R5334 3.9k
R5339 3.9k
R5340 3.9k
Q5307 (64)
Q5306 (64)
C5320 6.8/20
L5302 100µ
D5301 (M2R)
LCD DRIVE [LCD]
A
B
C
D
E
1
2
3
4
5
6
7
8

IC BLOCK DIAGRAMS

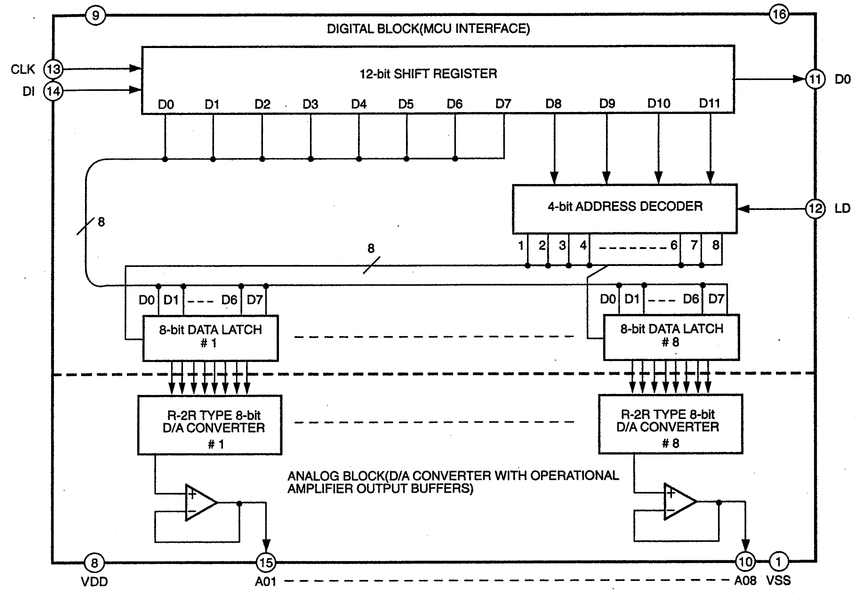
IC0101
HA118189MPER
VIDEO HEAD AMP


CH1 REC
SW1
PB5V
Vcc (REC)
CH1 PRE
GND
CH2 PRE
FM PHASE EQ
FM AGC
AGC DET
REC EQ
L
H
SW3
CH2 REC
PB5V
SW2
Vcc (PB)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

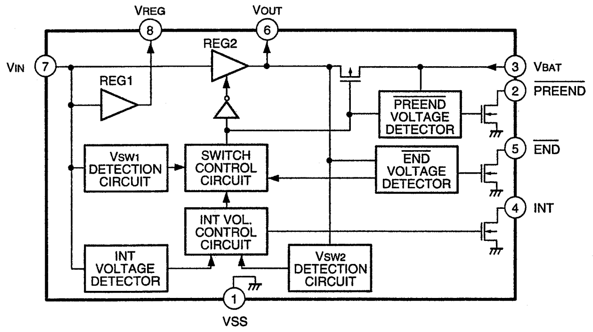
IC0202
HD49323AF
CDS/ADC &
A/D CONV.


SPBLK
SPSIG
ADCLK
VRT
VRM
VRB
OE
YIN
CIN
CDSIN
VRM2
CLP
GAIN SELECT
CDS
AGC
10bit ADC
OUTPUT LATCH
CLAMP
SERIAL I/F
BIAS GEN
D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
OBP
SCK
SDATA
CS
BIAS
PBLK

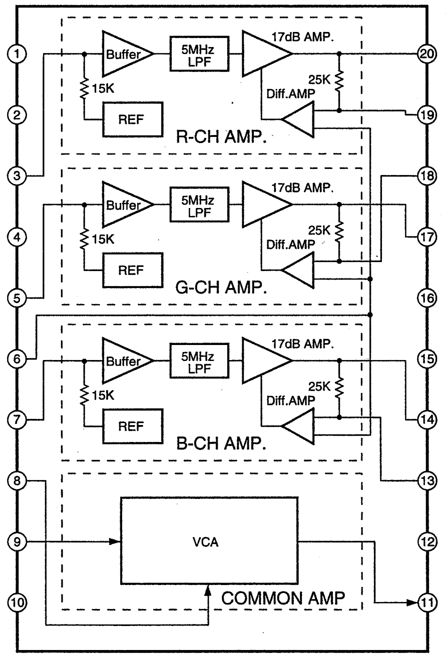
IC1111
MB88347PFV
D/A CONV.


VCC
GND
DIGITAL BLOCK(MCU INTERFACE)
CLK
DI
12-bit SHIFT REGISTER
D0
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
4-bit ADDRESS DECODER
LD
8
8-bit DATA LATCH #1
8-bit DATA LATCH #8
R-2R TYPE 8-bit D/A CONVERTER #1
R-2R TYPE 8-bit D/A CONVERTER #8
ANALOG BLOCK(D/A CONVERTER WITH OPERATIONAL AMPLIFIER OUTPUT BUFFERS)
VDD
A01
A08
VSS

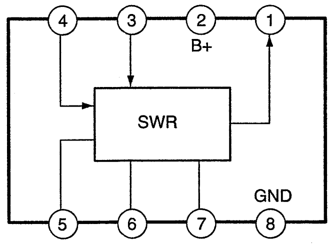
IC0902
NJU7285BV
BACK-UP DET


VREG
VOUT
VIN
REG1
REG2
VBAT
PREEND
PREEND VOLTAGE DETECTOR
VSW1 DETECTION CIRCUIT
SWITCH CONTROL CIRCUIT
END VOLTAGE DETECTOR
END
INT
INT VOL. CONTROL CIRCUIT
INT VOLTAGE DETECTOR
VSW2 DETECTION CIRCUIT
VSS

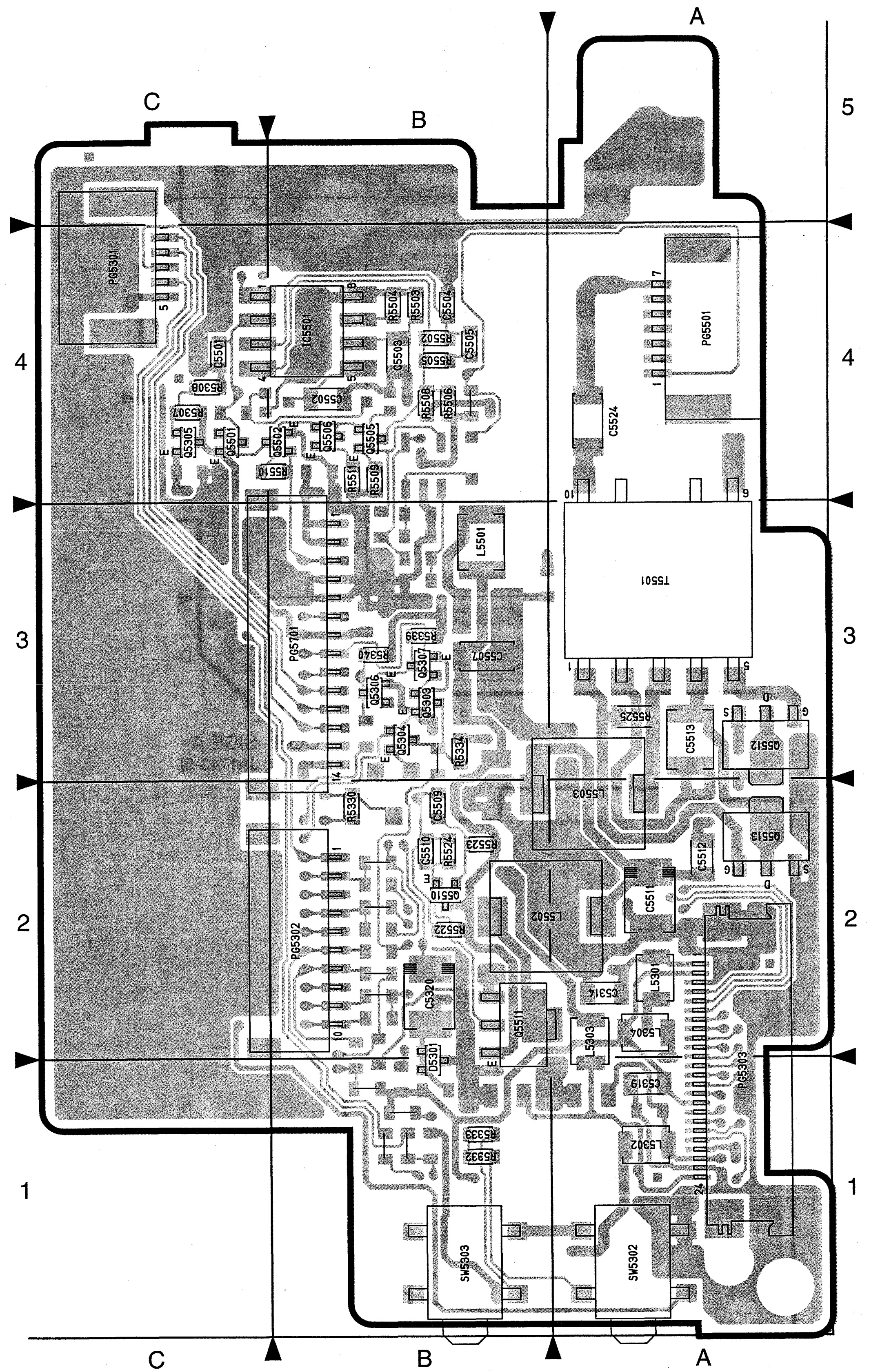
IC0350
μPC5020GR-125-8J
RGB AMP


Buffer
5MHz LPF
17dB AMP.
25K
15K
Diff.AMP
REF
R-CH AMP.
G-CH AMP.
B-CH AMP.
VCA
COMMON AMP

IC5501
TL5001CD
SWR


B+
SWR
GND
1
2
3
4
5
6
7
8

LCD CIRCUIT BOARD DIAGRAM


A
B
C
1
2
3
4
5
PG5301
PG5501
PG5701
PG5302
PG5303
IC5501
IC5502
IC5503
IC5507
T5501
L5501
L5502
L5503
L5301
L5302
L5303
L5304
Q5501
Q5502
Q5505
Q5506
Q5509
Q5510
Q5511
Q5512
Q5513
Q5301
Q5303
Q5304
Q5305
Q5306
Q5307
C5501
C5503
C5505
C5509
C5510
C5511
C5512
C5513
C5524
C5314
C5319
C5320
R5501
R5502
R5503
R5504
R5505
R5506
R5508
R5509
R5510
R5511
R5522
R5523
R5524
R5525
R5307
R5308
R5330
R5332
R5333
R5334
R5339
R5340
SW5302
SW5303

LCD [PATTERN No.JA1754-5]

DIFFERENCE TABLE

NOTE: This table listes the different components marked with asterisks (*) in the circuit board diagrams.

SE [SENSOR/GYRO] -SIDE A-

SYMBOL No.	TYPE 768/765/665/ 660/565	TYPE 568/563/ 368/360
C1405	○	×
C1406	○	×
C1411	○	×
C1412	○	×
C1417	○	×
R1401	JUMPER	×
R1418	JUMPER	×

SE [SENSOR/GYRO] -SIDE B-

SYMBOL No.	TYPE 768/765/665/ 660/565	TYPE 568/563/ 368/360
C1403	○	×
C1404	○	×
C1407	○	×
C1408	○	×
C1409	○	×
C1410	○	×
C1413	○	×
C1414	○	×
C1415	○	×
IC1401	○	×
IC1402	○	×
IC1403	○	×
Q1401	○	×
Q1402	○	×
R1403	○	×
R1404	○	×
R1405	○	×
R1406	○	×
R1407	○	×
R1408	○	×
R1409	○	×
R1410	○	×
R1411	○	×
R1412	○	×
R1413	○	×
R1414	○	×
R1416	○	×
R1424	○	×
R1425	○	×

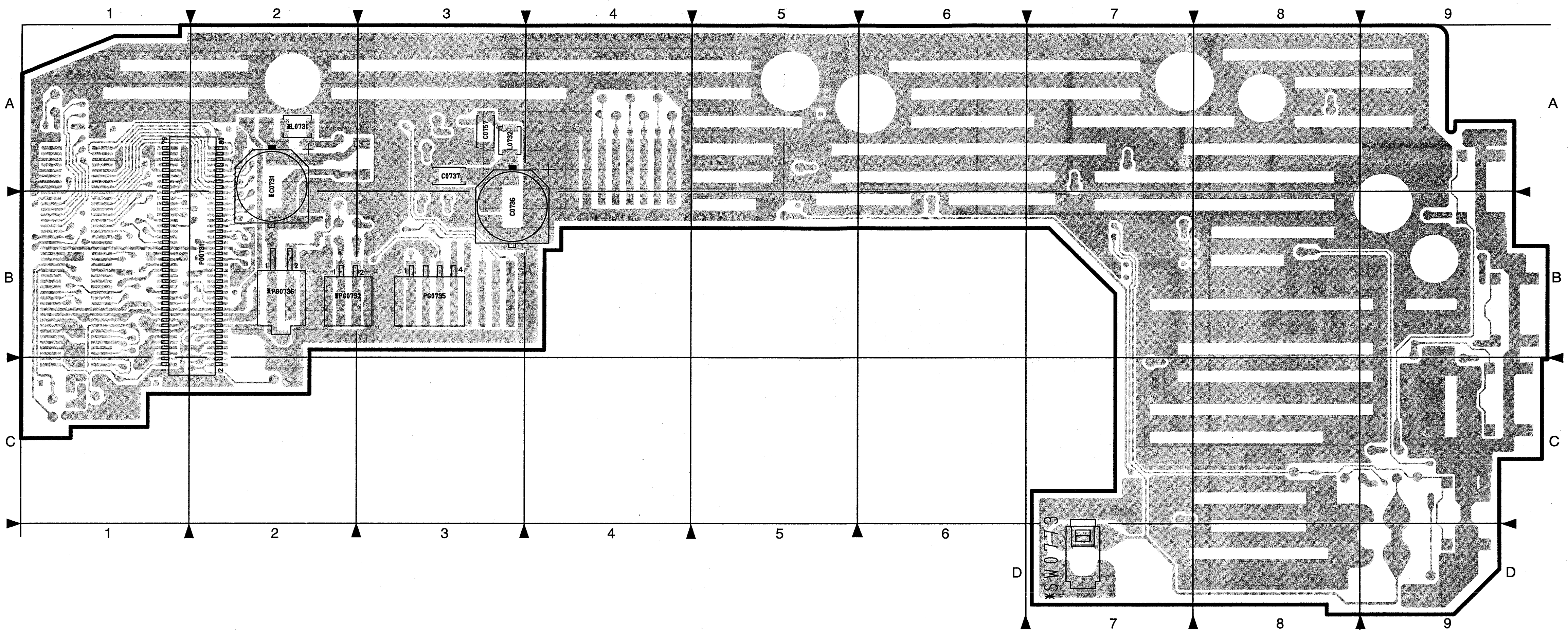
CON [CONTROL] -SIDE A-

SYMBOL No.	TYPE 768/765/665	TYPE 660	TYPE 565/563	TYPE 568	TYPE 368/360
C0731	○	×	○	○	×
L0731	○	×	○	○	×
PG0732	○	×	○	○	×
PG0736	○	×	○	○	×
SW0773	○	×	○	○	×

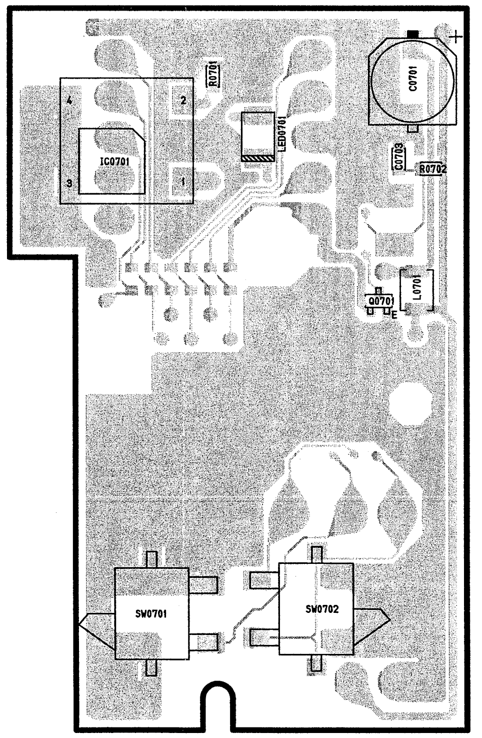
CON [CONTROL] -SIDE B-

SYMBOL No.	TYPE 768/765/665	TYPE 660	TYPE 565/563	TYPE 568	TYPE 368/360
PG0733	○	×	○	○	×
PG0734	○	×	○	○	×
R0763	○	○	○	×	×
R0767	○	○	○	×	×
SW0781	○	○	○	×	×

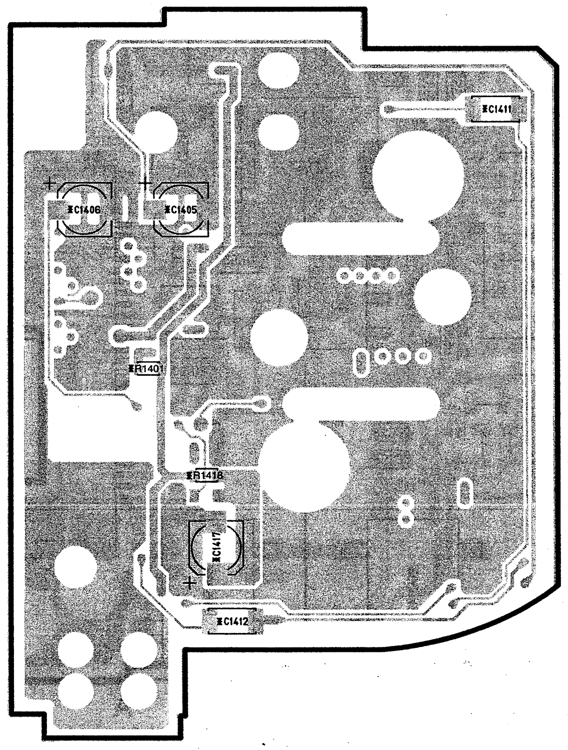
CON, SE, PSW CIRCUIT BOARD DIAGRAMS -SIDE A-


1
2
3
4
5
6
7
8
9
A
B
C
D
L0731
C0731
C0737
C0757
L0732
C0736
PG0731
PG0736
PG0732
PG0735
SW0773

CON –SIDE A–
[PATTERN No.JA1743-5]

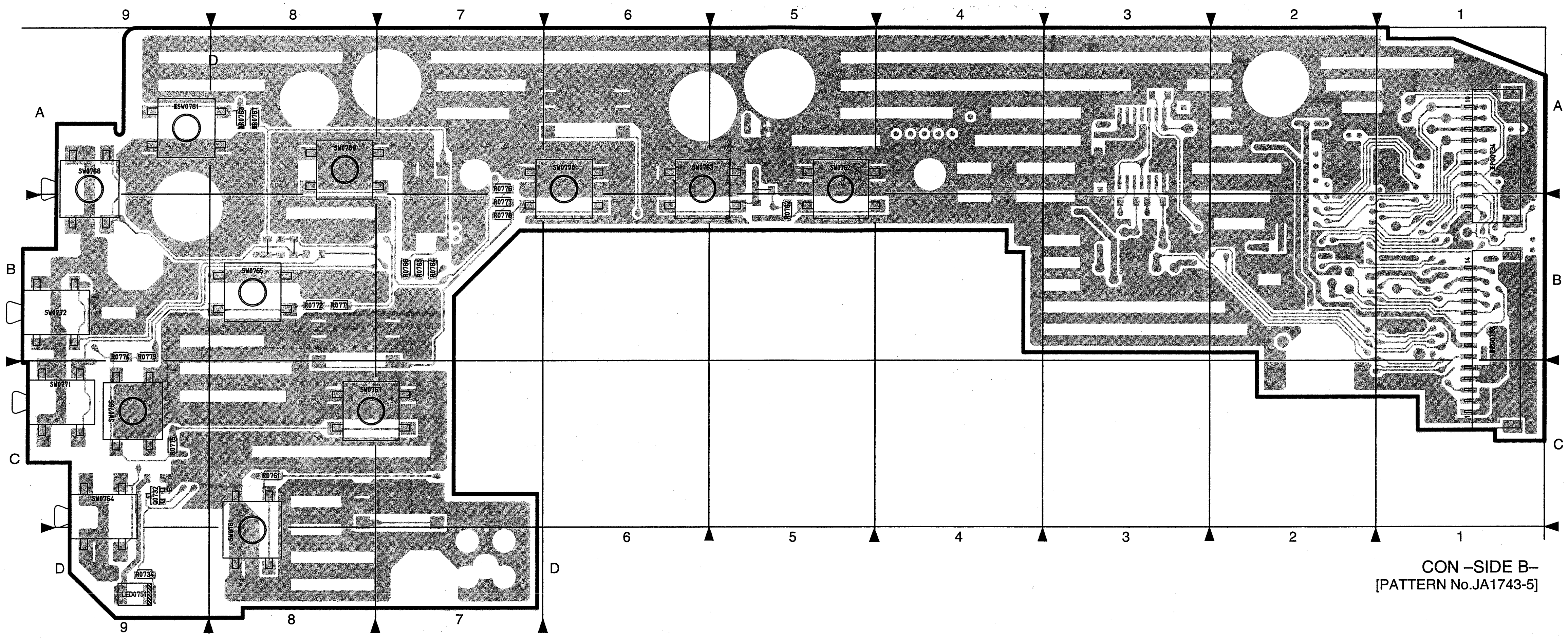

R0701
LED0701
IC0701
C0701
C0702
R0702
Q0701
L0701
SW0701
SW0702

PSW –SIDE A–
[PATTERN No.JA1743-5]

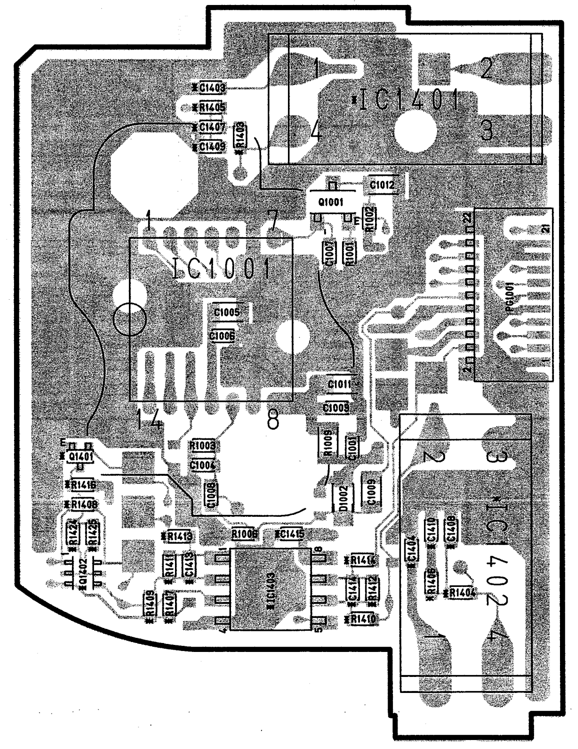

C1411
C1406
C1405
R1401
R1418
C1417
C1412

SE –SIDE A–
[PATTERN No.JA1743-5]

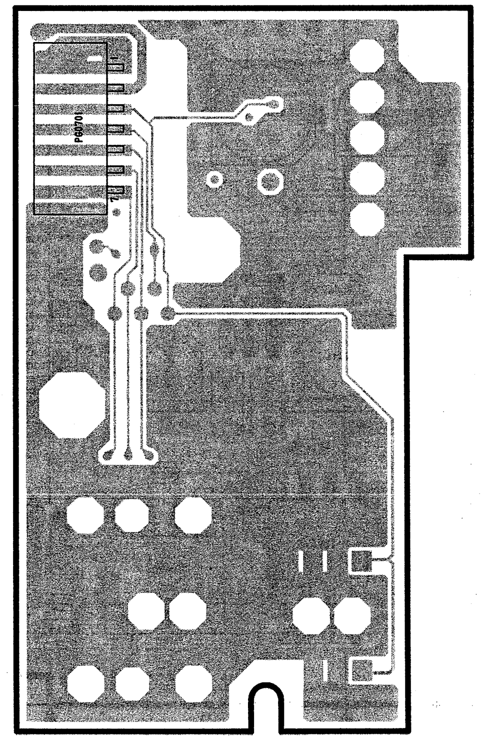
CON, SE, PSW CIRCUIT BOARD DIAGRAMS -SIDE B-


9
8
7
6
5
4
3
2
1
A
B
C
D
SW0761
SW0769
SW0768
SW0765
SW0772
SW0771
SW0766
SW0767
SW0764
SW0770
SW0763
SW0762
R0776
R0777
R0778
R0772
R0773
R0774
R0775
R0761
R0734
LED0751

CON –SIDE B–
[PATTERN No.JA1743-5]

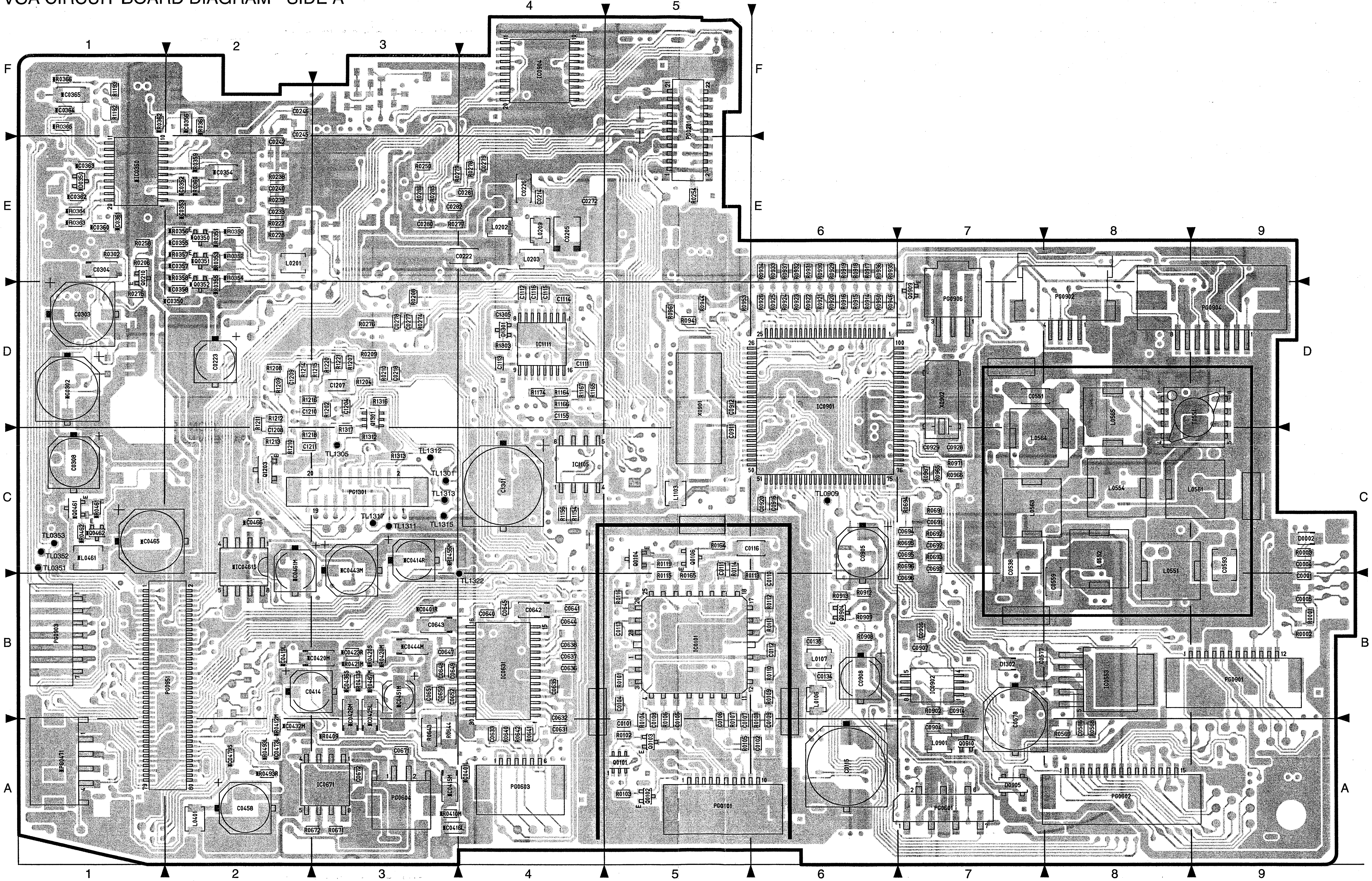

IC1401
IC1001
IC1402
1
2
3
4
7
8
Q1001
C1012
C1005
C1006
C1011
C1009
R1003
C1004
Q1401
Q1402
R1413
R1406
C1415
R1404

SE –SIDE B–
[PATTERN No.JA1743-5]



PSW –SIDE B–
[PATTERN No.JA1743-5]

VCA CIRCUIT BOARD DIAGRAM -SIDE A-


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
IC0350
IC0904
PG0201
IC1111
IC1105
C1301
PG1301
X0901
IC0901
X0902
PG0906
PG0902
PG0904
L0562
L0565
IC0551
L0554
L0561
L0563
L0552
L0551
C0303
C0302
C0308
C0465
IC04615
C0223
C0414
IC0631
IC0671
PG0604
PG0603
IC0101
PG0101
C0905
C0908
C0115
IQ0902
C0578
IC0553
PG0901
PG0602
PG0601
PG0903
PG0951
PG0471
C0458
TL0353
TL0352
TL0351
TL1305
TL1312
TL1301
TL1313
TL1317
TL1311
TL1315
TL1322
TL0909

VCA –SIDE A–
[PATTERN No.JA1743-5]

DIFFERENCE TABLE

NOTE: This table listes the different components marked with asterisks (∗) in the circuit board diagrams.

VCA [MAIN] -SIDE A-

SYMBOL No.	TYPE 768	TYPE 765/665	TYPE 660	TYPE 568/565/563	TYPE 368/360
C0302	○	○	○	×	×
C0350	○	○	×	○	×
C0352	○	○	×	○	×
C0353	○	○	×	○	×
C0354	○	○	×	○	×
C0355	○	○	×	○	×
C0356	○	○	×	○	×
C0357	○	○	×	○	×
C0358	○	○	×	○	×
C0360	○	○	×	○	×
C0361	○	○	×	○	×
C0362	○	○	×	○	×
C0363	○	○	×	○	×
C0364	○	○	×	○	×
C0365	○	○	×	○	×
C0401L	×	○	×	×	×
C0401R	×	○	×	×	×
C0414R	×	○	×	×	×
C0415M	○	×	○	○	○
C0416L	×	○	×	×	×
C0419L	×	○	×	×	×
C0420M	○	×	○	○	○
C0423R	×	○	×	×	×
C0425L	×	○	×	×	×
C0426M	○	×	○	○	○
C0432M	○	×	○	○	○
C0436S	×	○	×	×	×
C0443M	○	×	○	○	○
C0444M	○	×	○	○	○
C0451M	○	×	○	○	○
C0461M	○	×	○	○	○
C0465	○	○	×	○	×
C0466	○	○	×	○	×
C0473L	×	○	×	×	×
C0479S	×	○	×	×	×
D0350	○	○	×	○	×
IC0350	○	○	×	○	×
IC0461S	×	○	×	×	×
L0461	○	○	×	○	×
PG0471	2P	4P	2P	2P	2P
Q0350	○	○	×	○	×
Q0351	○	○	×	○	×
Q0352	○	○	×	○	×
Q0461	○	○	×	○	×
Q0462	○	○	×	○	×
R0350	JUMPER	JUMPER	×	JUMPER	×
R0351	○	○	×	○	×
R0352	JUMPER	JUMPER	×	JUMPER	×
R0353	○	○	×	○	×
R0354	JUMPER	JUMPER	×	JUMPER	×
R0355	○	○	×	○	×

SYMBOL No.	TYPE 768	TYPE 765/665	TYPE 660	TYPE 568/565/563	TYPE 368/360
R0356	○	○	×	○	×
R0357	○	○	×	○	×
R0358	○	○	×	○	×
R0359	○	○	×	○	×
R0360	○	○	×	○	×
R0361	○	○	×	○	×
R0362	○	○	×	○	×
R0363	JUMPER	JUMPER	×	JUMPER	×
R0364	JUMPER	JUMPER	×	JUMPER	×
R0365	JUMPER	JUMPER	×	JUMPER	×
R0366	○	○	×	○	×
R0409	○	JUMPER	○	○	○
R0410M	JUMPER	×	JUMPER	JUMPER	JUMPER
R0412M	JUMPER	×	JUMPER	JUMPER	JUMPER
R0413S	×	JUMPER	×	×	×
R0420M	JUMPER	×	×	JUMPER	×
R0420S	×	JUMPER	×	×	×
R0421M	JUMPER	×	JUMPER	JUMPER	JUMPER
R0455M	JUMPER	×	JUMPER	JUMPER	JUMPER
R0461	○	○	×	○	×
R0462	○	○	×	○	×
R0487M	JUMPER	×	JUMPER	JUMPER	JUMPER
R0493L	×	○	×	×	×
R0493R	×	○	×	×	×

DIFFERENCE TABLE

NOTE: This table listes the different components marked with asterisks (⋆) in the circuit board diagrams.

VCA [MAIN] -SIDE B-

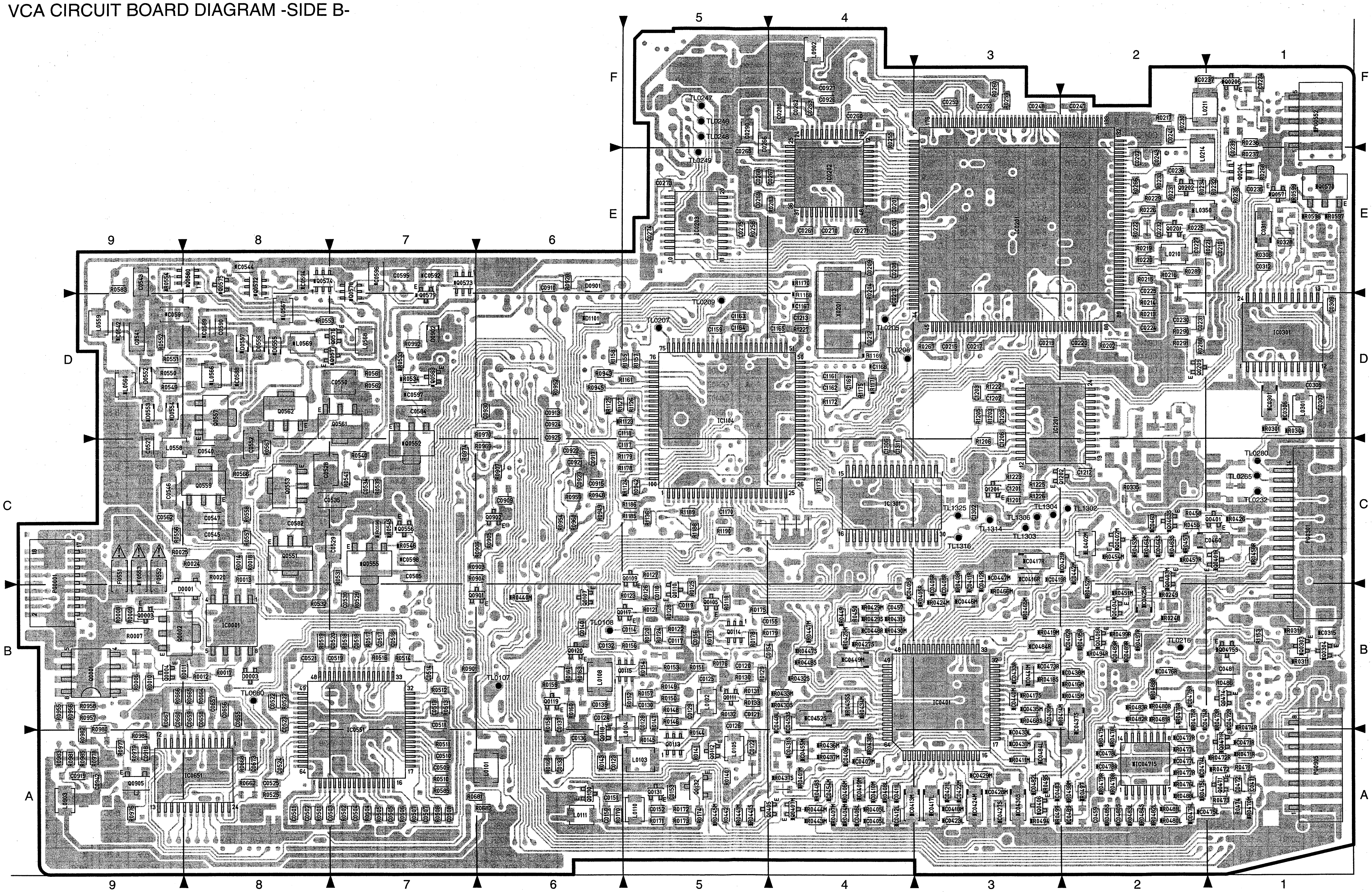
SYMBOL No.	TYPE 768	TYPE 765	TYPE 665	TYPE 660	TYPE 568	TYPE 565	TYPE 563	TYPE 368/360
C0237	○	○	○	○	×	×	×	×
C0301	○	○	○	○	×	×	×	×
C0306	○	○	○	○	×	×	×	×
C0315	○	○	○	×	×	○	○	×
C0405L	×	○	○	×	×	×	×	×
C0405R	×	○	○	×	×	×	×	×
C0406L	×	○	○	×	×	×	×	×
C0406R	×	○	○	×	×	×	×	×
C0407M	○	×	×	○	○	○	○	○
C0408L	×	○	○	×	×	×	×	×
C0408R	×	○	○	×	×	×	×	×
C0409M	○	×	×	○	○	○	○	○
C0410M	○	×	×	○	○	○	○	○
C0411L	×	○	○	×	×	×	×	×
C0411R	×	○	○	×	×	×	×	×
C0412L	×	○	○	×	×	×	×	×
C0412R	×	○	○	×	×	×	×	×
C0413M	○	×	×	○	○	○	○	○
C0416R	×	○	○	×	×	×	×	×
C0417L	×	○	○	×	×	×	×	×
C0417R	×	○	○	×	×	×	×	×
C0418M	○	×	×	○	○	○	○	○
C0419R	×	○	○	×	×	×	×	×
C0421L	×	○	○	×	×	×	×	×
C0421R	×	○	○	×	×	×	×	×
C0422M	○	×	×	○	○	○	○	○
C0423L	×	○	○	×	×	×	×	×
C0424M	○	×	×	○	○	○	○	○
C0425R	×	○	○	×	×	×	×	×
C0427S	×	○	○	×	×	×	×	×
C0428M	○	×	×	○	○	○	○	○
C0429M	○	×	×	○	○	○	○	○
C0430S	×	○	○	×	×	×	×	×
C0431M	○	×	×	○	○	○	○	○
C0431S	×	○	○	×	×	×	×	×
C0433L	×	○	○	×	×	×	×	×
C0433R	×	○	○	×	×	×	×	×
C0435M	○	×	×	○	○	○	○	○
C0437S	×	○	○	×	×	×	×	×
C0438M	○	×	×	○	○	○	○	○
C0439M	○	×	×	○	○	○	○	○
C0440M	○	×	×	○	○	○	○	○
C0441M	○	×	×	○	○	○	○	○
C0442M	○	×	×	○	○	○	○	○
C0446M	○	×	×	○	○	○	○	○
C0447M	○	×	×	×	○	○	○	×
C0448L	×	○	○	×	×	×	×	×
C0448R	×	○	○	×	×	×	×	×
C0449M	○	×	×	○	○	○	○	○
C0452S	×	○	○	×	×	×	×	×
C0453S	×	○	○	×	×	×	×	×
C0454M	○	×	×	○	○	○	○	○
C0455M	○	×	×	○	○	○	○	○
C0463	○	○	○	×	○	○	○	×
C0464S	×	○	○	×	×	×	×	×
C0471R	×	○	○	×	×	×	×	×
C0472R	×	○	○	×	×	×	×	×
C0473R	×	○	○	×	×	×	×	×
C0474L	×	○	○	×	×	×	×	×
C0474R	×	○	○	×	×	×	×	×
C0475L	×	○	○	×	×	×	×	×
C0475R	×	○	○	×	×	×	×	×
C0476L	×	○	○	×	×	×	×	×
C0476R	×	○	○	×	×	×	×	×
C0477L	×	○	○	×	×	×	×	×
C0477R	×	○	○	×	×	×	×	×
C0478L	×	○	○	×	×	×	×	×
C0478R	×	○	○	×	×	×	×	×
C0480S	×	○	○	×	×	×	×	×
C0482L	×	○	○	×	×	×	×	×
C0482R	×	○	○	×	×	×	×	×
C0483	○	○	○	×	×	○	○	×
C0483R	×	○	○	×	×	×	×	×
C0484L	×	○	○	×	×	×	×	×
C0484R	×	○	○	×	×	×	×	×
C0489	○	○	○	×	×	○	○	×

SYMBOL No.	TYPE 768	TYPE 765	TYPE 665	TYPE 660	TYPE 568	TYPE 565	TYPE 563	TYPE 368/360
C0489R	○	○	○	×	×	○	○	×
C0542	○	○	○	×	○	○	○	×
C0544	○	○	○	×	○	○	○	×
C0588	○	○	○	×	○	○	○	×
C0589	○	○	○	×	○	○	○	×
C0591	○	○	○	×	○	○	○	×
C0592	○	○	○	×	○	○	○	×
C0594	○	○	○	×	○	○	○	×
C0596	○	○	○	×	○	○	○	×
C0597	○	○	○	×	○	○	○	×
C0598	○	○	○	×	○	○	○	×
C1167	○	○	○	○	×	○	×	×
C1168	○	○	○	○	×	○	×	×
D0553	○	○	○	×	○	○	○	×
D0554	○	○	○	×	○	○	○	×
D0555	○	○	○	×	○	○	○	×
D0557	○	○	○	×	○	○	○	×
D1101	○	○	×	×	×	×	×	×
F0553	○	○	○	×	○	○	○	×
IC0471S	×	○	○	×	×	×	×	×
L0350	○	○	○	×	○	○	○	×
L0402M	○	×	×	○	○	○	○	○
L0560	○	○	○	×	○	○	○	×
L0566	○	○	○	×	○	○	○	×
L0567	○	○	○	×	○	○	○	×
L0569	○	○	○	×	○	○	○	×
PG0552	○	○	×	×	×	×	×	×
Q0206	○	○	○	○	×	×	×	×
Q0303	○	○	○	×	×	○	○	×
Q0304	○	○	○	×	×	○	○	×
Q0401R	×	○	○	×	×	×	×	×
Q0402M	○	×	×	○	○	○	○	○
Q0403M	○	×	×	×	×	○	○	×
Q0404M	○	×	×	×	×	○	○	×
Q0406	○	○	○	×	×	○	○	×
Q0406R	×	○	○	×	×	×	×	×
Q0407M	○	×	×	○	○	○	○	○
Q0463S	×	○	○	×	×	×	×	×
Q0471R	×	○	○	×	×	×	×	×
Q0475S	×	○	○	×	×	×	×	×
Q0552	○	○	○	×	○	○	○	×
Q0555	○	○	○	×	○	○	○	×
Q0556	○	○	○	×	○	○	○	×
Q0563	○	○	○	×	○	○	○	×
Q0570	○	○	×	×	×	×	×	×
Q0571	○	○	×	×	×	×	×	×
Q0572	○	○	○	×	○	○	○	×
Q0573	○	○	○	×	○	○	○	×
Q0574	○	○	○	×	○	○	○	×
Q0575	○	○	○	×	○	○	○	×
Q0577	○	○	○	×	○	○	○	×
Q0578	○	○	○	×	○	○	○	×
Q0579	○	○	○	×	○	○	○	×
Q0580	○	○	○	×	○	○	○	×
R0248	○	○	○	×	×	○	○	×
R0249	○	○	○	×	×	○	○	×
R0301	○	○	○	○	×	×	×	×
R0304	○	○	○	○	×	×	×	×
R0310	×	×	×	JUMPER	JUMPER	×	×	JUMPER
R0311	○	○	○	×	×	○	○	×
R0401M	○	×	×	○	○	○	○	○
R0404M	○	×	×	○	○	○	○	○
R0405L	×	○	○	×	×	×	×	×
R0405R	×	○	○	×	×	×	×	×
R0406M	○	×	×	○	○	○	○	○
R0407M	○	×	×	○	○	○	○	○
R0408L	×	JUMPER	JUMPER	×	×	×	×	×
R0408R	×	JUMPER	JUMPER	×	×	×	×	×
R0411M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0414M	○	×	×	○	○	○	○	○
R0415M	○	×	×	○	○	○	○	○
R0416M	○	×	×	○	○	○	○	○
R0417S	×	JUMPER	JUMPER	×	×	×	×	×
R0418S	×	JUMPER	JUMPER	×	×	×	×	×
R0419M	○	×	×	○	○	○	○	○
R0424M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER

SYMBOL No.	TYPE 768	TYPE 765	TYPE 665	TYPE 660	TYPE 568	TYPE 565	TYPE 563	TYPE 368/360
R0425M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0426	○	JUMPER	JUMPER	○	○	○	○	○
R0427S	×	JUMPER	JUMPER	×	×	×	×	×
R0429M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0429S	×	JUMPER	JUMPER	×	×	×	×	×
R0430M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0431S	×	○	○	×	×	×	×	×
R0432S	×	○	○	×	×	×	×	×
R0433M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0433S	×	JUMPER	JUMPER	×	×	×	×	×
R0434M	○	×	×	○	○	○	○	○
R0435S	×	○	○	×	×	×	×	×
R0436M	○	×	×	○	○	○	○	○
R0437M	○	×	×	○	○	○	○	○
R0437S	×	JUMPER	JUMPER	×	×	×	×	×
R0438S	×	JUMPER	JUMPER	×	×	×	×	×
R0440M	○	×	×	○	○	○	○	○
R0441M	JUMPER	×	×	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0441S	×	JUMPER	JUMPER	×	×	×	×	×
R0443M	○	×	×	○	○	○	○	○
R0444M	○	×	×	○	○	○	○	○
R0445M	○	×	×	○	○	○	○	○
R0446S	×	○	○	×	×	×	×	×
R0447M	○	×	×	○	○	○	○	○
R0447S	×	○	○	×	×	×	×	×
R0448S	×	○	○	×	×	×	×	×
R0449	○	○	○	×	○	○	○	×
R0451M	○	×	×	×	×	○	○	×
R0452M	○	×	×	×	×	○	○	×
R0453M	○	×	×	○	○	○	○	○
R0454M	○	×	×	○	○	○	○	○
R0457L	×	○	○	×	×	×	×	×
R0457R	×	○	○	×	×	×	×	×
R0458R	×	○	○	×	×	×	×	×
R0463S	×	○	○	×	×	×	×	×
R0464S	×	○	○	×	×	×	×	×
R0465M	JUMPER	×	×	×	JUMPER	JUMPER	JUMPER	×
R0466M	JUMPER	×	×	×	JUMPER	JUMPER	JUMPER	×
R0468S	×	○	○	×	×	×	×	×
R0470M	○	×	×	○	○	○	○	○
R0471R	×	○	○	×	×	×	×	×
R0472	JUMPER	○	○	JUMPER	JUMPER	JUMPER	JUMPER	JUMPER
R0472R	×	○	○	×	×	×	×	×
R0473R	×	○	○	×	×	×	×	×
R0474R	×	○	○	×	×	×	×	×
R0475L	×	○	○	×	×	×	×	×
R0475R	×	○	○	×	×	×	×	×
R0476L	×	○	○	×	×	×	×	×
R0476R	×	○	○	×	×	×	×	×
R0477L	×	○	○	×	×	×	×	×
R0477R	×	○	○	×	×	×	×	×
R0478L	×	○	○	×	×	×	×	×
R0478R	×	○	○	×	×	×	×	×
R0479L	×	○	○	×	×	×	×	×
R0479R	×	○	○	×	×	×	×	×
R0480L	×	○	○	×	×	×	×	×
R0480R	×	○	○	×	×	×	×	×
R0481L	×	○	○	×	×	×	×	×
R0481R	×	○	○	×	×	×	×	×
R0482L	×	○	○	×	×	×	×	×
R0482R	×	○	○	×	×	×	×	×
R0483L	×	○	○	×	×	×	×	×
R0483R	×	○	○	×	×	×	×	×
R0484S	×	○	○	×	×	×	×	×
R0485S	×	○	○	×	×	×	×	×
R0488L	×	JUMPER	JUMPER	×	×	×	×	×
R0488R	×	JUMPER	JUMPER	×	×	×	×	×
R0494	○	○	○	×	×	○	○	×
R0494R	×	○	○	×	×	×	×	×
R0495	○	○	○	×	×	○	○	×
R0495R	×	○	○	×	×	×	×	×
R0497	JUMPER	JUMPER	JUMPER	×	×	JUMPER	JUMPER	×
R0497R	JUMPER	JUMPER	JUMPER	×	×	JUMPER	JUMPER	×
R0498M	JUMPER	×	×	×	×	JUMPER	JUMPER	×
R0499	○	○	○	×	×	○	○	×
R0499R	×	○	○	×	×	×	×	×

SYMBOL No.	TYPE 768	TYPE 765	TYPE 665	TYPE 660	TYPE 568	TYPE 565	TYPE 563	TYPE 368/360
R0533	○	○	○	×	○	○	○	×
R0534	○	○	○	×	○	○	○	×
R0545	○	○	○	×	○	○	○	×
R0546	○	○	○	×	○	○	○	×
R0553	○	○	○	×	○	○	○	×
R0554	○	○	○	×	○	○	○	×
R0596	×	×	×	JUMPER	×	×	×	JUMPER
R0597	○	○	×	×	×	×	×	×
R0598	○	○	×	×	×	×	×	×
R0599	○	○	×	×	×	×	×	×
R1123	○	○	×	×	×	×	×	×
R1124	○	○	×	×	×	×	×	×
R1125	○	○	×	×	×	×	×	×
R1168	×	×	×	×	JUMPER	×	JUMPER	JUMPER
R1169	×	×	×	×	JUMPER	×	JUMPER	JUMPER
R1170	○	○	○	○	×	○	×	×
R1171	○	○	○	○	×	○	×	×

VCA CIRCUIT BOARD DIAGRAM -SIDE B-



9
8
7
6
5
4
3
2
1
F
E
D
C
B
A
IC0001
IC0202
IC0201
IC0301
IC1104
IC1201
IC1301
IC0401
IC0551
IC0651
IC0471S
IC0203
Q0001
Q0002
D0001
X0201
P0001
P0301
P0601
P0052
TL0247
TL0246
TL0248
TL0249
TL0209
TL0207
TL0205
TL0208
TL0280
TL0265
TL0232
TL1325
TL1306
TL1304
TL1302
TL1314
TL1303
TL1316
TL0108
TL0107
TL0660
TL0216
L0101
L0103
L0108
L0111
L0210
L0211
L0214
L0559
L0558
L0566
L0569
L0568
L0560
L0567
Q0551
Q0553
Q0557
Q0559
Q0561
Q0562
Q0552
Q0555
Q0570
Q0905
F0551
F0552
F0553

VCA –SIDE B–

[PATTERN No.JA1743-5]

IDENTIFICATION OF PARTS LOCATION

VCA

Symbol No.	Parts Location
C	
C0001	A-9B
C0004	A-9C
C0005	A-9B
C0101	A-5A
C0102	A-6A
C0104	A-5B
C0105	A-5A
C0106	A-5A
C0107	A-5A
C0108	A-5A
C0109	A-6A
C0110	A-6B
C0111	A-5C
C0112	A-6B
C0113	A-5B
C0114	B-5B
C0115	A-6A
C0116	A-6C
C0117	B-5B
C0118	B-5B
C0119	B-5B
C0120	B-5B
C0121	B-5B
C0122	B-5A
C0123	B-6A
C0124	B-6B
C0125	B-5B
C0126	B-5B
C0128	B-5B
C0129	B-5B
C0130	B-5B
C0132	B-6B
C0133	B-6A
C0134	A-6B
C0135	A-6B
C0136	B-6A
C0137	B-6B
C0139	B-6B
C0140	B-6B
C0150	B-6A
C0151	B-6A
C0152	B-5A
C0153	B-5A
C0154	B-4B
C0155	B-4B
C0156	B-5B
C0201	B-4E
C0202	B-2E
C0203	B-4E
C0205	A-4E
C0208	B-4E
C0209	B-4E
C0210	B-1E
C0212	B-4D
C0213	B-4D
C0214	A-4E
C0215	B-3D
C0217	B-3D
C0218	A-3D
C0219	B-3D
C0220	B-2D
C0222	A-4E
C0223	A-2D
C0224	B-2D
C0225	B-2E
C0226	A-4E
C0227	B-2E
C0230	B-2D
C0231	B-2D
C0232	B-2E
C0233	A-2E
C0234	B-1F
C0235	B-1E
C0236	B-2E
C0237	B-1F
C0239	B-1E
C0240	A-2E
C0241	B-2F
C0242	A-2E
C0243	B-2E
C0245	A-2F
C0246	A-2F
C0247	B-2F
C0248	B-3F
C0252	B-3F
C0253	B-3F
C0260	B-4F
C0261	B-4E
C0262	B-4F
C0263	B-4F
C0265	B-5E
C0266	B-5F
C0267	B-4E
C0268	B-5E
C0269	B-5E
C0270	B-4E
C0271	B-4E
C0272	A-4E
C0273	B-5E
C0274	B-5E
C0275	B-5E
C0277	A-3D
C0278	A-3D
C0279	A-4E
C0280	A-3E
C0281	A-4E
C0282	A-3E
C0285	B-4F
C0290	B-5F
C0301	B-1D
C0302	A-1D
C0303	A-1D
C0304	A-1E
C0305	B-1D
C0306	B-1D
C0307	B-1D
C0308	A-1C
C0309	B-1D
C0311	B-1E
C0312	B-1E
C0315	B-1B
C0350	A-2D
C0352	A-2E
C0353	A-2E
C0354	A-2E
C0355	A-2E
C0356	A-2F
C0357	A-2E
C0358	A-2D
C0360	A-1E
C0361	A-1E
C0362	A-1E
C0363	A-1E
C0364	A-1F
C0365	A-1F
C0401L	A-4A
C0401R	A-3B
C0405L	B-4A
C0405R	B-4B
C0406L	B-4A
C0406R	B-3B
C0407M	B-4A
C0408L	B-4A
C0408R	B-3B
C0409M	B-4A
C0410M	B-4A
C0411L	B-4A
C0411R	B-3B
C0412L	B-4A
C0412R	B-3B
C0413M	B-4A
C0414	A-2B
C0414R	A-3C
C0415M	A-3A
C0416L	A-3A
C0416R	B-3C
C0417L	B-3A
C0417R	B-3C
C0418M	B-3A
C0419L	A-2B
C0419R	B-3C
C0420M	A-3B
C0421L	B-3A
C0421R	B-2C
C0422M	B-3A
C0423L	B-3A
C0423R	A-3B
C0424M	B-3A
C0425L	A-3B
C0425R	B-2B
C0426M	A-3B
C0427S	B-3A
C0428M	B-3A
C0429M	B-3A
C0430S	B-3A
C0431M	B-3A
C0431S	B-4A
C0432M	A-2A
C0433L	B-3A
C0433R	B-3B
C0435M	B-3B
C0436S	A-3B
C0437S	B-2B
C0438M	B-2B
C0439M	B-3B
C0440M	B-3B
C0441M	B-3B
C0442M	B-2C
C0443M	A-3C
C0444M	A-3B
C0446M	B-3B
C0447M	B-3C
C0448L	B-4B
C0448R	B-4B
C0449M	B-4B
C0451M	A-3B
C0452S	B-4B
C0453S	B-4B
C0454M	B-4A
C0455M	B-4A
C0457	B-4B
C0458	A-2A
C0459	B-2A
C0460	B-1C
C0461M	A-2C
C0463	B-2C
C0464S	B-2C
C0465	A-1C
C0466	A-2C
C0471	B-1A
C0471R	B-1A
C0472	B-1A
C0472R	B-1B
C0473L	A-2A
C0473R	B-3B
C0474L	B-2A
C0474R	B-2B
C0475L	B-1A
C0475R	B-2B
C0476L	B-2A
C0476R	B-2B
C0477L	B-2A
C0477R	B-2A
C0478L	B-2A
C0478R	B-2A
C0479S	A-2A
C0480S	B-2A
C0481	B-1B
C0482L	B-3A
C0482R	B-2B
C0483	B-3A
C0483R	B-2B
C0484L	B-3A
C0484R	B-3B
C0489	B-2A
C0489R	B-2B
C0501	B-8A
C0502	B-8A
C0503	B-7A
C0504	B-7A
C0505	B-7A
C0507	B-7A
C0508	B-7A
C0509	B-7A
C0510	B-7A
C0511	B-7B
C0513	B-7B
C0514	B-7B
C0516	B-7B
C0517	B-7B
C0518	B-7B
C0519	B-7B
C0520	B-7B
C0521	B-8B
C0522	B-8B
C0523	B-8B
C0524	B-8A
C0525	B-8A
C0527	B-9C
C0528	B-8C
C0529	B-7C
C0530	B-7B
C0534	B-7C
C0535	B-7C
C0538	A-7C
C0540	B-8C
C0541	B-9D
C0542	B-9D
C0543	B-9E
C0544	B-8E
C0545	B-8C
C0546	B-9C
C0547	B-8C
C0550	B-7D
C0551	A-7D
C0552	B-8C
C0559	A-8B
C0562	B-9C
C0577	A-7B
C0578	A-7A
C0582	B-8C
C0584	B-7D
C0585	B-7C
C0586	A-8A
C0588	B-8D
C0589	B-8D
C0590	B-8D
C0591	B-9D
C0592	B-7E
C0593	A-9C
C0594	B-8E
C0595	B-7E
C0596	B-7E
C0597	B-7D
C0598	B-7C
C0631	A-4A
C0632	A-4B
C0633	A-4A
C0635	A-4B
C0636	A-4B
C0637	A-4B
C0638	A-4B
C0640	A-4B
C0641	A-4B
C0642	A-4B
C0643	A-3B
C0644	A-4B
C0645	A-4B
C0647	A-3B
C0648	A-3B
C0649	A-3B
C0650	A-3B
C0651	A-3B
C0652	A-3B
C0655	B-8B
C0656	B-8B
C0657	B-8B
C0658	B-8B
C0659	B-8B
C0660	B-9B
C0671	A-3A
C0672	A-3A
C0673	B-8A
C0691	A-7C
C0692	A-7C
C0693	A-7C
C0694	A-7C
C0695	A-7C
C0696	A-7B
C0904	A-7A
C0905	A-6C
C0906	A-7B
C0907	A-7B
C0908	A-6B
C0909	B-6C
C0910	B-6E
C0911	A-5C
C0912	A-5D
C0913	B-6D
C0914	A-7B
C0915	B-6C
C0916	A-6C
C0917	B-6C
C0918	B-9A
C0919	B-9A
C0920	A-6C
C0921	B-6C
C0922	B-6C
C0923	B-6C
C0924	B-6D
C0925	B-6D
C0926	B-4F
C0927	B-4F
C0928	A-7C
C0929	A-7C
C0930	B-6D
C0942	B-9A
C1111	A-4D
C1112	A-4D
C1113	A-4D
C1114	A-4D
C1115	A-4D
C1116	A-4D
C1117	B-5C
C1118	B-5D
C1155	A-4D
C1159	B-5D
C1161	B-4D
C1162	B-4D
C1163	B-5D
C1164	B-5D
C1165	B-4D
C1167	B-4D
C1168	B-4D
C1169	B-4D
C1170	B-5C
C1201	B-3C
C1202	B-3D
C1203	B-3D
C1204	A-3D
C1205	B-3D
C1206	B-3C
C1207	A-3D
C1208	A-2C
C1209	A-2D
C1210	A-2D
C1211	A-2C
C1212	B-2C
C1213	B-4D
C1301	A-4C
C1302	B-3C
C1305	A-4D
C1306	B-4C
C1311	B-4C
D	
D0001	B-8B
D0002	A-9C
D0003	B-8B
D0350	A-1E
D0552	B-9D
D0553	B-9D
D0554	B-9D
D0555	B-8D
D0556	B-8D
D0557	B-8D
D0901	B-6E
D0902	B-7D
D0905	A-7A
D1101	B-6D
D1301	A-4D
D1302	A-7B
F	
F0551	B-9C
F0552	B-9C
F0553	B-9C
IC	
IC0001	B-8B
IC0101	A-5B
IC0201	B-3E
IC0202	B-4E
IC0203	B-5E
IC0301	B-1D
IC0350	A-1E
IC0401	B-3B
IC0461S	A-2C
IC0471S	B-2A
IC0551	B-7A
IC0553	A-8B
IC0631	A-4B
IC0651	B-8A
IC0671	A-3A
IC0901	A-6D
IC0902	A-7B
IC0904	A-4F
IC1104	B-5D
IC1105	A-4C
IC1111	A-4D
IC1201	B-3D
IC1301	B-4C
L	
L0101	B-6A
L0102	B-5B
L0103	B-5A
L0104	B-5A
L0105	B-5A
L0106	A-6B
L0107	A-6B
L0108	B-6B
L0110	B-5A
L0111	B-6A
L0201	A-2E
L0202	A-4E
L0203	A-4E
L0209	A-4E
L0210	B-2E
L0211	B-1F
L0214	B-2E
L0301	B-1D
L0350	B-2E
L0401	A-2A
L0402M	B-2C
L0461	A-1C
L0551	A-8C
L0552	A-8C
L0554	A-8C
L0558	B-9C
L0559	B-9D
L0560	B-9D
L0561	A-9C
L0563	A-7C
L0564	A-7C
L0565	A-8D
L0566	B-8D
L0567	B-8D
L0568	B-7D
L0569	B-8D
L0901	A-7A
L0902	B-4F
L0903	B-9A
L1103	A-5C
PG	
PG0001	B-9C
PG0101	A-5A
PG0201	A-5F
PG0301	B-1C
PG0471	A-1A
PG0552	B-1F
PG0601	A-7A
PG0602	A-8A
PG0603	A-4A
PG0604	A-3A
PG0901	A-9B
PG0902	A-8D
PG0903	A-1B
PG0904	A-9D
PG0905	B-1A
PG0906	A-7D
PG0951	A-1B
PG1301	A-3C
Q	
Q0001	B-9B
Q0002	B-9B
Q0003	B-9B
Q0004	B-9B
Q0101	A-5A
Q0102	A-5A
Q0103	A-5A
Q0104	A-5C
Q0105	B-5B
Q0106	A-5C
Q0107	B-6B
Q0109	B-5C
Q0110	B-5B
Q0111	B-5B
Q0112	B-5A
Q0113	B-5A
Q0114	B-5B
Q0115	B-5B
Q0117	B-5B
Q0118	B-6A
Q0119	B-6B
Q0120	B-6B
Q0130	B-6A
Q0131	B-5A
Q0132	B-5A
Q0201	B-2E
Q0202	B-2E
Q0204	B-1E
Q0206	B-1F
Q0209	B-2D
Q0210	A-1E
Q0303	B-1B
Q0304	B-1B
Q0350	A-2E
Q0351	A-2E
Q0352	A-2D
Q0401	B-1C
Q0401R	B-1C
Q0402M	B-2C
Q0403M	B-2C
Q0404M	B-2B
Q0405	B-4A
Q0406	B-3A
Q0406R	B-2B
Q0407M	B-4A
Q0461	A-1C
Q0462	A-1C
Q0463S	B-2C
Q0471	B-1A
Q0471R	B-1A
Q0474	B-1B
Q0475S	B-1B
Q0551	B-8C
Q0552	B-7C
Q0553	B-8C
Q0555	B-7C
Q0556	B-7C
Q0557	B-8D
Q0559	B-8C
Q0561	B-7D
Q0562	B-8D
Q0563	B-7D
Q0570	B-1E
Q0571	B-1E
Q0572	B-8E
Q0573	B-7E
Q0574	B-8E
Q0575	B-8E
Q0576	B-7D
Q0577	B-7D
Q0578	B-7E
Q0579	B-7D
Q0580	B-8E
Q0901	B-6B
Q0902	B-6C
Q0904	A-6B
Q0905	B-9A
Q0909	A-7D
Q0910	A-7A
Q1201	B-3C
Q1202	B-2C
Q1203	A-2C
Q1301	A-3D
R	
R0001	A-9B
R0002	A-9B
R0003	A-9C
R0006	B-9B
R0007	B-9B
R0008	B-9B
R0009	B-9B
R0010	B-9B
R0011	B-8B
R0012	B-8B
R0013	B-8C
R0014	B-8C
R0017	B-8B
R0018	B-8C
R0020	B-8C
R0024	B-8C
R0025	B-9C
R0101	A-5B
R0102	A-5A
R0103	A-5A
R0104	A-5A
R0105	A-5A
R0106	A-5A
R0107	A-5A
R0108	A-6A
R0109	A-6B
R0110	A-6B
R0111	A-6B
R0112	A-6B
R0113	A-6B
R0114	A-5C
R0115	A-5B
R0116	A-5B
R0118	B-5B
R0119	A-5C
R0120	B-5B
R0121	B-5B
R0122	B-5B
R0123	B-5B
R0124	B-5B
R0125	B-5B
R0126	B-5B
R0127	B-5C
R0128	B-5B
R0129	B-5B
R0130	B-5B
R0131	B-5B
R0132	B-5B
R0133	B-5B
R0140	B-5A
R0141	B-5A
R0143	B-6B
R0144	B-5A
R0145	B-5A
R0146	B-5B
R0147	B-5B
R0148	B-5B
R0149	B-5B
R0150	B-5B
R0151	B-5B
R0152	B-5B
R0153	B-5B
R0154	B-5B
R0156	B-5B
R0157	B-5B
R0158	B-6B
R0159	B-6B
R0160	B-6B
R0161	B-6B
R0163	B-6B
R0164	A-5C
R0165	A-5B
R0166	B-6A
R0170	B-6A
R0171	B-5A
R0172	B-5A
R0173	B-5A
R0174	B-5A
R0175	B-5B
R0176	B-5B
R0177	B-5B
R0178	B-5B
R0179	B-4B
R0202	B-2D
R0204	B-4D
R0206	A-1E
R0208	A-3D
R0209	A-3D
R0210	A-3D
R0213	B-2D
R0214	B-2D
R0215	B-2E
R0216	B-2E
R0217	B-2F
R0219	B-2E
R0220	B-2E
R0221	B-1E
R0222	B-2E
R0225	B-2E
R0226	B-2E
R0227	A-2E
R0228	A-2E
R0229	B-2E
R0230	B-2F
R0231	B-2E
R0232	B-1E
R0233	B-2E
R0234	B-2E
R0235	B-1E
R0236	B-1F
R0237	B-1E
R0238	A-2E
R0239	A-2E
R0248	B-2B
R0249	B-2B
R0250	A-3E
R0254	A-5E
R0255	B-4F
R0256	B-5E
R0258	A-1E
R0259	B-3F
R0260	B-3F
R0266	B-2E
R0267	B-3D
R0268	B-1E
R0274	A-3D
R0275	A-1D
R0276	A-3D
R0277	A-3E
R0278	A-4E
R0279	A-3E
R0283	B-4E
R0285	A-3E
R0286	A-3E
R0288	B-2D
R0289	B-2E
R0290	B-2D
R0291	B-2D
R0301	B-1D
R0302	A-1E
R0304	B-1D
R0306	B-1E
R0310	B-1B
R0311	B-1B
R0328	B-1E
R0335	B-2C
R0350	A-2E
R0351	A-2E
R0352	A-2E
R0353	A-2E
R0354	A-2E
R0355	A-2D
R0356	A-2E
R0357	A-2E
R0358	A-2E
R0359	A-2E
R0360	A-2E
R0361	A-2F
R0362	A-1F
R0363	A-1E
R0364	A-1E
R0365	A-1F
R0366	A-1F
R0401M	B-4A
R0404M	B-4A
R0405L	B-4A
R0405R	B-3B
R0406M	B-4A
R0407M	B-4A
R0408L	B-4A
R0408R	B-3B
R0409	A-3A
R0410M	A-3A
R0411M	B-3A
R0412M	A-2A
R0413S	A-3B
R0414M	B-2B
R0415M	B-2B
R0416M	B-2B
R0417S	B-3B
R0418S	B-3B
R0419M	B-3B
R0420M	A-3B
R0420S	A-3B
R0421M	A-3B
R0424M	B-3B
R0425M	B-4B
R0426	B-1C
R0427S	B-4B
R0429M	B-4B
R0429S	B-4B
R0430M	B-4B
R0431S	B-4B
R0432S	B-4B
R0433M	B-4B
R0433S	B-4B
R0434M	B-4B
R0435S	B-4B
R0436M	B-4A
R0437M	B-4A
R0437S	B-4A
R0438S	B-4A
R0440M	B-6B
R0441M	B-5A
R0441S	B-5A
R0442	B-5A
R0443M	B-4A
R0444M	B-4A
R0445M	B-5A
R0446S	B-4A
R0447M	B-4B
R0447S	B-4B
R0448S	B-4B
R0449	B-4B
R0450	B-4B
R0451M	B-2B
R0452M	B-2B
R0453M	B-2C
R0454M	B-2C
R0455M	A-3C
R0456	B-2C
R0457L	B-2C
R0457R	B-2C
R0458	B-2C
R0458R	B-1C
R0461	A-1C
R0462	A-1C
R0463S	B-2C
R0464S	B-2C
R0465M	B-3B
R0466M	B-3B
R0468S	B-3B
R0470M	B-1A
R0471	B-1A
R0471R	B-1A
R0472	B-1A
R0472R	B-1A
R0473	B-1A
R0473R	B-1B
R0474	B-1A
R0474R	B-1B
R0475L	B-2A
R0475R	B-2B
R0476L	B-2A
R0476R	B-2B
R0477L	B-2A
R0477R	B-2A
R0478L	B-2A
R0478R	B-2A
R0479L	B-2A
R0479R	B-2A
R0480L	B-2A
R0480R	B-2B
R0481L	B-2A
R0481R	B-2B
R0482L	B-2A
R0482R	B-2B
R0483L	B-2A
R0483R	B-2B
R0484S	B-2A
R0485S	B-2A
R0486	B-1B
R0487M	A-3B
R0488L	B-2A
R0488R	B-2B
R0493L	A-2A
R0493R	A-2A
R0494	B-3A
R0494R	B-2B
R0495	B-3A
R0495R	B-2B
R0497	B-2A
R0497R	B-2B
R0498M	B-2A
R0499	B-3A
R0499R	B-2B
R0501	B-8A
R0502	B-7A
R0504	B-7A
R0505	B-7A
R0506	B-7A
R0507	B-7A
R0508	B-7A
R0510	B-7A
R0511	B-7A
R0512	B-7B
R0513	B-7B
R0514	B-7B
R0516	B-7B
R0517	B-7B
R0518	B-7B
R0519	B-8B
R0522	B-8B
R0525	B-8A
R0529	B-7B
R0531	B-7C
R0532	B-8B
R0533	B-7D
R0534	B-7D
R0539	B-7C
R0540	B-7C
R0541	B-7C
R0545	B-7C
R0546	B-7C
R0549	B-9D
R0550	B-9D
R0551	B-9D
R0552	B-9D
R0553	B-8D
R0554	B-9E
R0556	B-9C
R0557	B-8C
R0558	B-8C
R0561	B-7D
R0562	B-7D
R0566	B-8C
R0567	B-8C
R0568	A-8A
R0569	A-8A
R0583	B-9E
R0585	B-7A
R0596	B-7C
R0597	B-1E
R0598	B-1E
R0599	B-1E
R0640	A-4A
R0641	A-4A
R0642	A-4A
R0643	A-3A
R0644	A-3A
R0662	B-8A
R0664	B-8B
R0665	B-8B
R0666	B-9B
R0667	B-9B
R0668	B-8A
R0671	A-3A
R0672	A-3A
R0681	B-6A
R0682	B-6A
R0691	A-7C
R0692	A-7C
R0693	A-7C
R0694	A-7C
R0695	A-7C
R0696	A-7C
R0901	B-7B
R0902	A-7B
R0903	B-6C
R0904	B-6C
R0905	B-6C
R0906	B-6C
R0907	B-6C
R0908	A-6B
R0909	A-6B
R0912	A-6B
R0913	A-6B
R0914	A-6D
R0915	A-6D
R0916	A-6D
R0917	A-6E
R0918	A-6E
R0919	A-6E
R0920	A-6D
R0921	A-6D
R0922	A-6D
R0923	A-6D
R0924	A-6D
R0925	A-6D
R0926	A-6D
R0928	B-6E
R0929	A-6E
R0930	A-6E
R0931	A-6E
R0932	A-6E
R0933	A-6E
R0934	A-6E
R0935	A-6E
R0936	A-6E
R0937	A-6E
R0941	A-5D
R0942	B-5C
R0943	B-6D
R0944	A-5D
R0945	B-6D
R0946	A-6D
R0948	B-6C
R0949	B-6C
R0950	A-6D
R0952	B-6D
R0953	A-5D
R0954	B-6C
R0955	B-9B
R0956	B-9B
R0957	B-9B
R0958	B-9B
R0959	B-6C
R0960	B-6C
R0961	A-5D
R0965	A-7C
R0966	A-7C
R0967	A-7C
R0969	B-6C
R0970	B-6D
R0971	A-7C
R0974	B-7C
R0976	B-9A
R0977	B-9A
R0978	B-9A
R0979	B-9A
R0980	B-9A
R0981	B-9A
R0982	B-9A
R0983	B-9A
R0984	B-9A
R0985	B-9A
R0992	B-7D
R1123	B-5D
R1124	B-5C
R1125	B-6D
R1126	B-5D
R1127	B-6D
R1136	B-5C
R1153	B-1B
R1154	A-4C
R1155	B-5D
R1156	A-4C
R1157	B-5D
R1158	B-6D
R1161	B-5D
R1164	A-4D
R1165	A-4D
R1166	A-4D
R1167	A-4D
R1170	B-4E
R1171	B-4D
R1172	B-4D
R1173	B-4C
R1174	A-4D
R1175	B-4D
R1178	B-5C
R1179	B-5C
R1185	B-5C
R1186	B-5C
R1188	B-5C
R1189	B-5C
R1190	B-5C
R1192	A-1F
R1193	A-1F
R1201	B-3C
R1202	A-3D
R1203	B-3D
R1204	A-3D
R1205	B-3D
R1206	B-3C
R1207	A-3D
R1208	A-2D
R1209	A-2D
R1210	A-2C
R1211	A-2D
R1212	A-2D
R1213	A-2C
R1214	A-2D
R1215	A-3D
R1216	A-2D
R1218	A-2C
R1220	A-3D
R1221	A-3D
R1222	B-3D
R1223	B-3C
R1225	B-3C
R1226	B-3C
R1227	B-4D
R1303	A-4D
R1312	A-3C
R1313	A-3C
R1316	A-3D
R1317	A-3C
T	
T0551	A-9D
TL	
TL0107	B-6B
TL0108	B-6B
TL0205	B-4D
TL0207	B-5D
TL0208	B-4D
TL0209	B-5D
TL0216	B-2B
TL0232	B-1C
TL0246	B-5F
TL0247	B-5F
TL0248	B-5F
TL0249	B-5F
TL0265	B-1C
TL0280	B-1C
TL0351	A-1C
TL0352	A-1C
TL0353	A-1C
TL0660	B-8B
TL0909	A-6C
TL1301	A-3C
TL1302	B-2C
TL1303	B-3C
TL1304	B-3C
TL1305	A-3C
TL1306	B-3C
TL1311	A-3C
TL1312	A-3C
TL1313	A-3C
TL1314	B-3C
TL1315	A-3C
TL1316	B-3C
TL1317	A-3C
TL1322	A-4B
TL1325	B-3C
X	
X0201	B-4D

Symbol No.	Parts Location
X0901	A-5D
X0902	A-7D

LCD

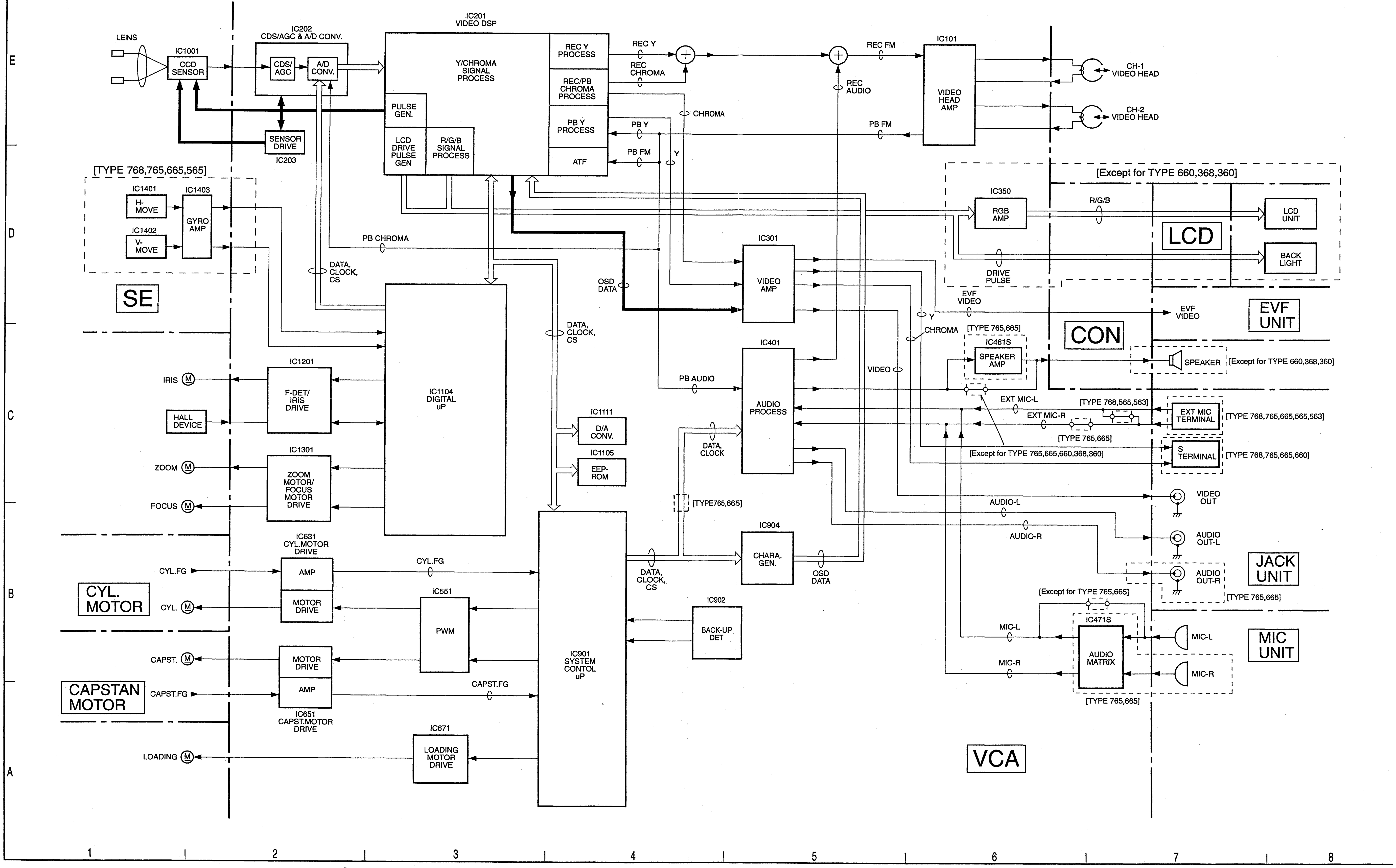
Symbol No.	Parts Location
C	
C5314	2A
C5319	1A
C5320	2B
C5501	4C
C5502	4B
C5503	4B
C5504	4B
C5505	4B
C5507	3B
C5509	2B
C5510	2B
C5511	2A
C5512	2A
C5513	3A
C5524	4A
D	
D5301	1B
IC	
IC5501	4B
L	
L5301	2A
L5302	1A
L5303	2A
L5304	2A
L5501	3B
L5502	2B
L5503	2A
PG	
PG5301	4C
PG5302	2B
PG5303	1A
PG5501	4A
PG5701	3B
Q	
Q5303	3B
Q5304	3B
Q5305	4C
Q5306	3B
Q5307	3B
Q5501	4C
Q5502	4B
Q5505	4B
Q5506	4B
Q5510	2B
Q5511	2B
Q5512	3A
Q5513	2A
R	
R5307	4C
R5308	4C
R5330	2B
R5332	1B
R5333	1B
R5334	3B
R5339	3B
R5340	3B
R5502	4B
R5503	4B
R5504	4B
R5505	4B
R5506	4B
R5508	4B
R5509	4B
R5510	4B
R5511	4B
R5522	2B
R5523	2B
R5524	2B
R5525	3A
SW	
SW5302	1A
SW5303	1B
T	
T5501	3A

CON

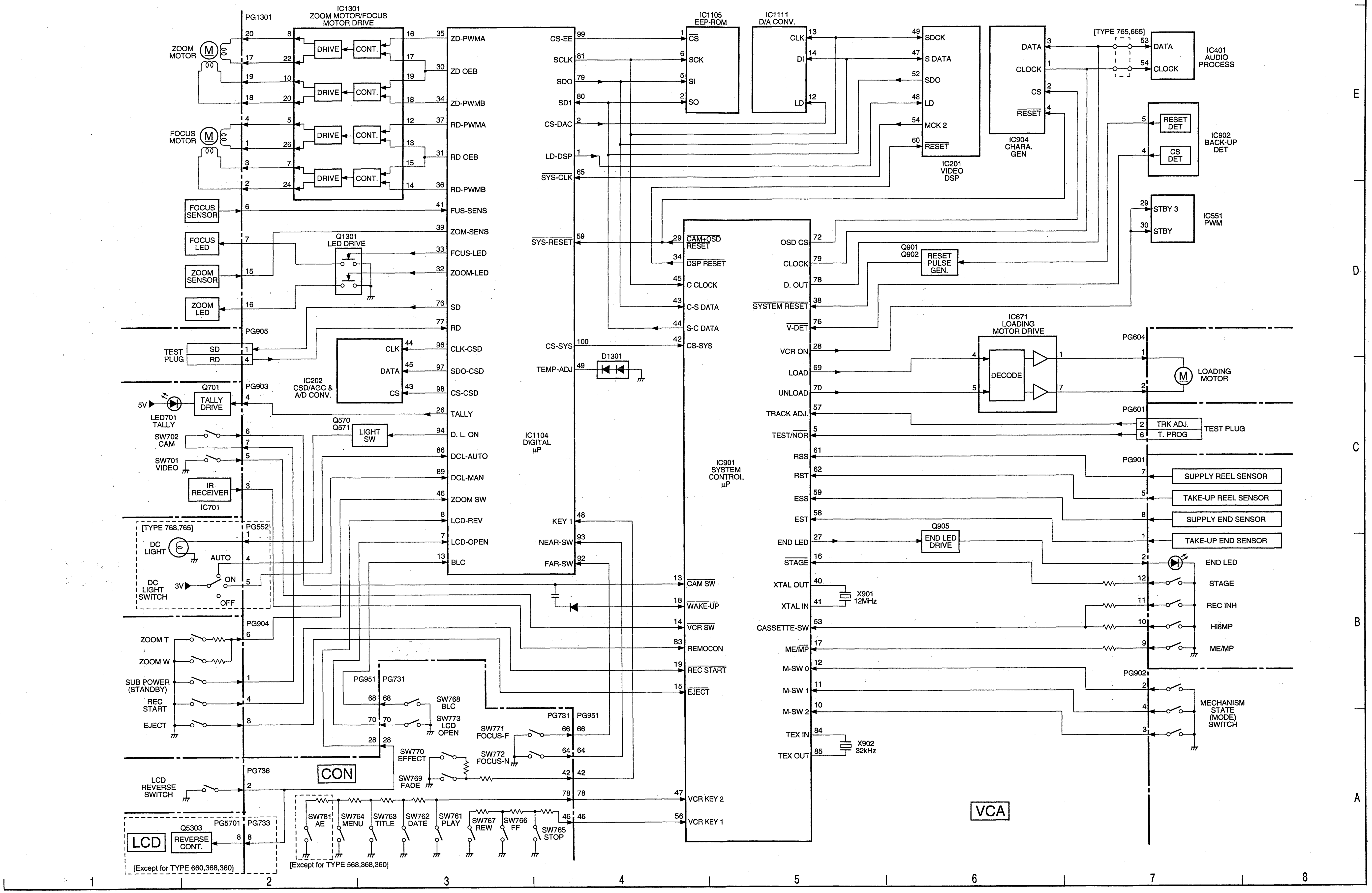
Symbol No.	Parts Location
C	
C0731	A-2A
C0736	A-3B
C0737	A-3A
C0757	A-3A
L	
L0731	A-2A
L0732	A-3A
LED	
LED0751	B-9D
PG	
PG0731	A-2B
PG0732	A-2B
PG0733	B-1B
PG0734	B-1A
PG0735	A-3B
PG0736	A-2B
Q	
Q0732	B-9C
R	
R0734	B-9D
R0761	B-8C
R0762	B-5B
R0763	B-8A
R0764	B-7B
R0765	B-7B
R0766	B-7B
R0767	B-8A
R0771	B-8B
R0772	B-8B
R0773	B-9B
R0774	B-9B
R0775	B-9C
R0776	B-7A
R0777	B-7B
R0778	B-7B
SW	
SW0761	B-8D
SW0762	B-5A
SW0763	B-6A
SW0764	B-9C
SW0765	B-8B
SW0766	B-9C
SW0767	B-8C
SW0768	B-9A
SW0769	B-8A
SW0770	B-6A
SW0771	B-9C
SW0772	B-9B
SW0773	A-7D
SW0781	B-9A

BLOCK DIAGRAMS

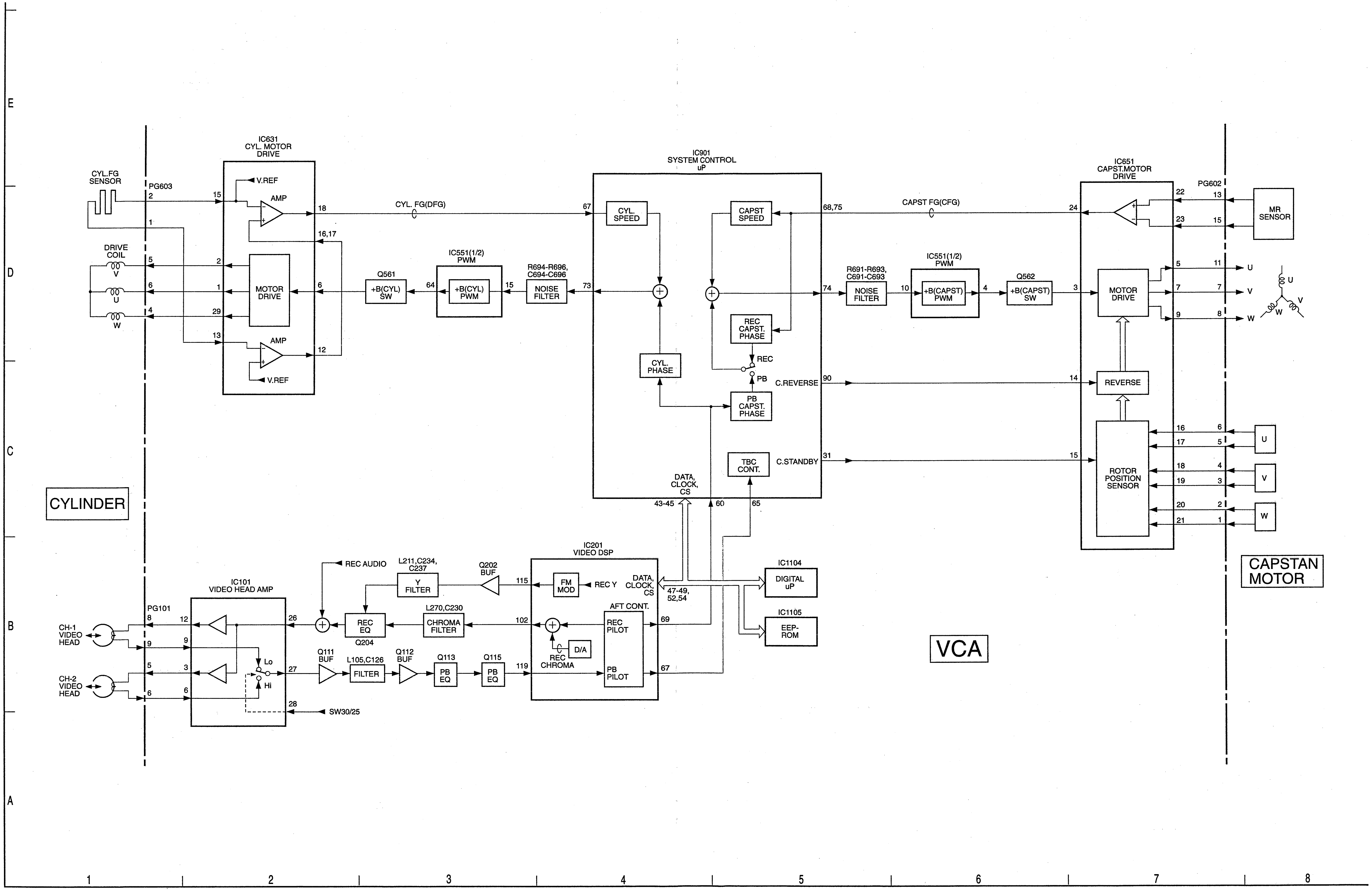
1. OVERALL BLOCK DIAGRAM


LENS
IC1001
CCD SENSOR
IC202
CDS/AGC & A/D CONV.
CDS/AGC
A/D CONV.
SENSOR DRIVE
IC203
IC201
VIDEO DSP
Y/CHROMA SIGNAL PROCESS
PULSE GEN.
LCD DRIVE PULSE GEN
R/G/B SIGNAL PROCESS
REC Y PROCESS
REC/PB CHROMA PROCESS
PB Y PROCESS
ATF
REC Y
REC CHROMA
CHROMA
PB Y
PB FM
Y
REC FM
REC AUDIO
PB FM
IC101
VIDEO HEAD AMP
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
[TYPE 768,765,665,565]
IC1401
H-MOVE
IC1402
V-MOVE
IC1403
GYRO AMP
SE
PB CHROMA
DATA, CLOCK, CS
IC1104
DIGITAL uP
DATA, CLOCK, CS
OSD DATA
IC301
VIDEO AMP
[Except for TYPE 660,368,360]
IC350
RGB AMP
R/G/B
DRIVE PULSE
LCD UNIT
BACK LIGHT
LCD
EVF VIDEO
Y
CHROMA
EVF VIDEO
EVF UNIT
CON
[TYPE 765,665]
IC461S
SPEAKER AMP
SPEAKER
[Except for TYPE 660,368,360]
IC401
AUDIO PROCESS
PB AUDIO
VIDEO
EXT MIC-L
EXT MIC-R
[TYPE 768,565,563]
[TYPE 765,665]
EXT MIC TERMINAL
[TYPE 768,765,665,565,563]
[Except for TYPE 765,665,660,368,360]
S TERMINAL
[TYPE 768,765,665,660]
IC1201
F-DET/ IRIS DRIVE
IRIS
HALL DEVICE
IC1301
ZOOM MOTOR/ FOCUS MOTOR DRIVE
ZOOM
FOCUS
IC1111
D/A CONV.
IC1105
EEP-ROM
DATA, CLOCK
[TYPE765,665]
VIDEO OUT
AUDIO-L
AUDIO-R
AUDIO OUT-L
AUDIO OUT-R
[TYPE 765,665]
JACK UNIT
IC904
CHARA. GEN.
OSD DATA
IC631
CYL.MOTOR DRIVE
AMP
MOTOR DRIVE
CYL.FG
CYL.
CYL. MOTOR
CYL.FG
IC551
PWM
IC901
SYSTEM CONTOL uP
DATA, CLOCK, CS
IC902
BACK-UP DET
[Except for TYPE 765,665]
MIC-L
MIC-R
IC471S
AUDIO MATRIX
[TYPE 765,665]
MIC-L
MIC-R
MIC UNIT
MOTOR DRIVE
AMP
IC651
CAPST.MOTOR DRIVE
CAPST.
CAPST.FG
CAPSTAN MOTOR
CAPST.FG
IC671
LOADING MOTOR DRIVE
LOADING
VCA
E
D
C
B
A
1
2
3
4
5
6
7
8

2. MAIN CONTROL BLOCK DIAGRAM

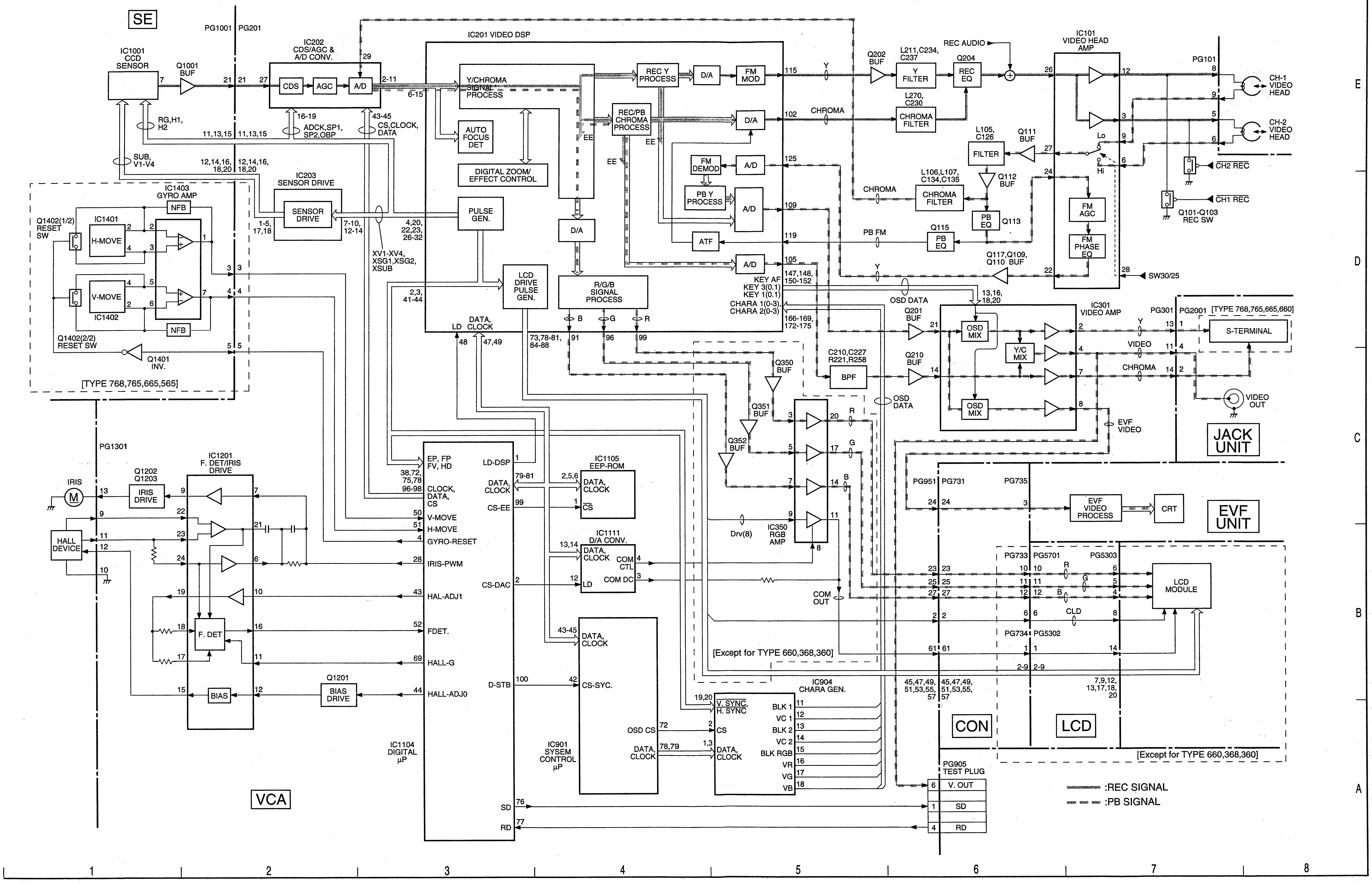

IC1301 ZOOM MOTOR/FOCUS MOTOR DRIVE
PG1301
ZOOM MOTOR
FOCUS MOTOR
DRIVE
CONT.
ZD-PWMA
ZD OEB
ZD-PWMB
RD-PWMA
RD OEB
RD-PWMB
FOCUS SENSOR
FUS-SENS
ZOM-SENS
FOCUS LED
Q1301 LED DRIVE
FCUS-LED
ZOOM SENSOR
ZOOM-LED
ZOOM LED
SD
RD
PG905
TEST PLUG
IC202 CSD/AGC & A/D CONV.
CLK
DATA
CS
CLK-CSD
SDO-CSD
CS-CSD
PG903
Q701 TALLY DRIVE
5V
LED701 TALLY
TALLY
Q570 Q571 LIGHT SW
D. L. ON
SW702 CAM
DCL-AUTO
SW701 VIDEO
DCL-MAN
IR RECEIVER
IC701
ZOOM SW
[TYPE 768,765]
PG552
DC LIGHT
AUTO
ON
OFF
DC LIGHT SWITCH
3V
LCD-REV
LCD-OPEN
BLC
PG904
ZOOM T
ZOOM W
SUB POWER (STANDBY)
REC START
EJECT
PG951
PG731
SW768 BLC
SW773 LCD OPEN
SW771 FOCUS-F
SW772 FOCUS-N
SW770 EFFECT
SW769 FADE
CON
PG736
LCD REVERSE SWITCH
LCD
Q5303 REVERSE CONT.
PG5701
PG733
[Except for TYPE 660,368,360]
SW781 AE
SW764 MENU
SW763 TITLE
SW762 DATE
SW761 PLAY
SW767 REW
SW766 FF
SW765 STOP
[Except for TYPE 568,368,360]
IC1104 DIGITAL µP
CS-EE
SCLK
SDO
SD1
CS-DAC
LD-DSP
SYS-CLK
SYS-RESET
CS-SYS
TEMP-ADJ
D1301
KEY 1
NEAR-SW
FAR-SW
IC1105 EEP-ROM
CS
SCK
SI
SO
IC1111 D/A CONV.
CLK
DI
LD
IC201 VIDEO DSP
SDCK
S DATA
SDO
LD
MCK 2
RESET
IC904 CHARA. GEN
DATA
CLOCK
CS
RESET
[TYPE 765,665]
IC401 AUDIO PROCESS
DATA
CLOCK
IC902 BACK-UP DET
RESET DET
CS DET
IC551 PWM
STBY 3
STBY
IC901 SYSTEM CONTROL µP
CAM+OSD RESET
DSP RESET
C CLOCK
C-S DATA
S-C DATA
CS-SYS
CAM SW
WAKE-UP
VCR SW
REMOCON
REC START
EJECT
VCR KEY 2
VCR KEY 1
OSD CS
CLOCK
D. OUT
SYSTEM RESET
V-DET
VCR ON
LOAD
UNLOAD
TRACK ADJ.
TEST/NOR
RSS
RST
ESS
EST
END LED
STAGE
XTAL OUT
XTAL IN
CASSETTE-SW
ME/MP
M-SW 0
M-SW 1
M-SW 2
TEX IN
TEX OUT
X901 12MHz
X902 32kHz
Q901 Q902 RESET PULSE GEN.
IC671 LOADING MOTOR DRIVE
DECODE
PG604
LOADING MOTOR
PG601
TRK ADJ.
T. PROG
TEST PLUG
PG901
SUPPLY REEL SENSOR
TAKE-UP REEL SENSOR
SUPPLY END SENSOR
TAKE-UP END SENSOR
Q905 END LED DRIVE
END LED
STAGE
REC INH
Hi8MP
ME/MP
PG902
MECHANISM STATE (MODE) SWITCH
VCA
A
B
C
D
E
1
2
3
4
5
6
7
8

3. SERVO BLOCK DIAGRAM

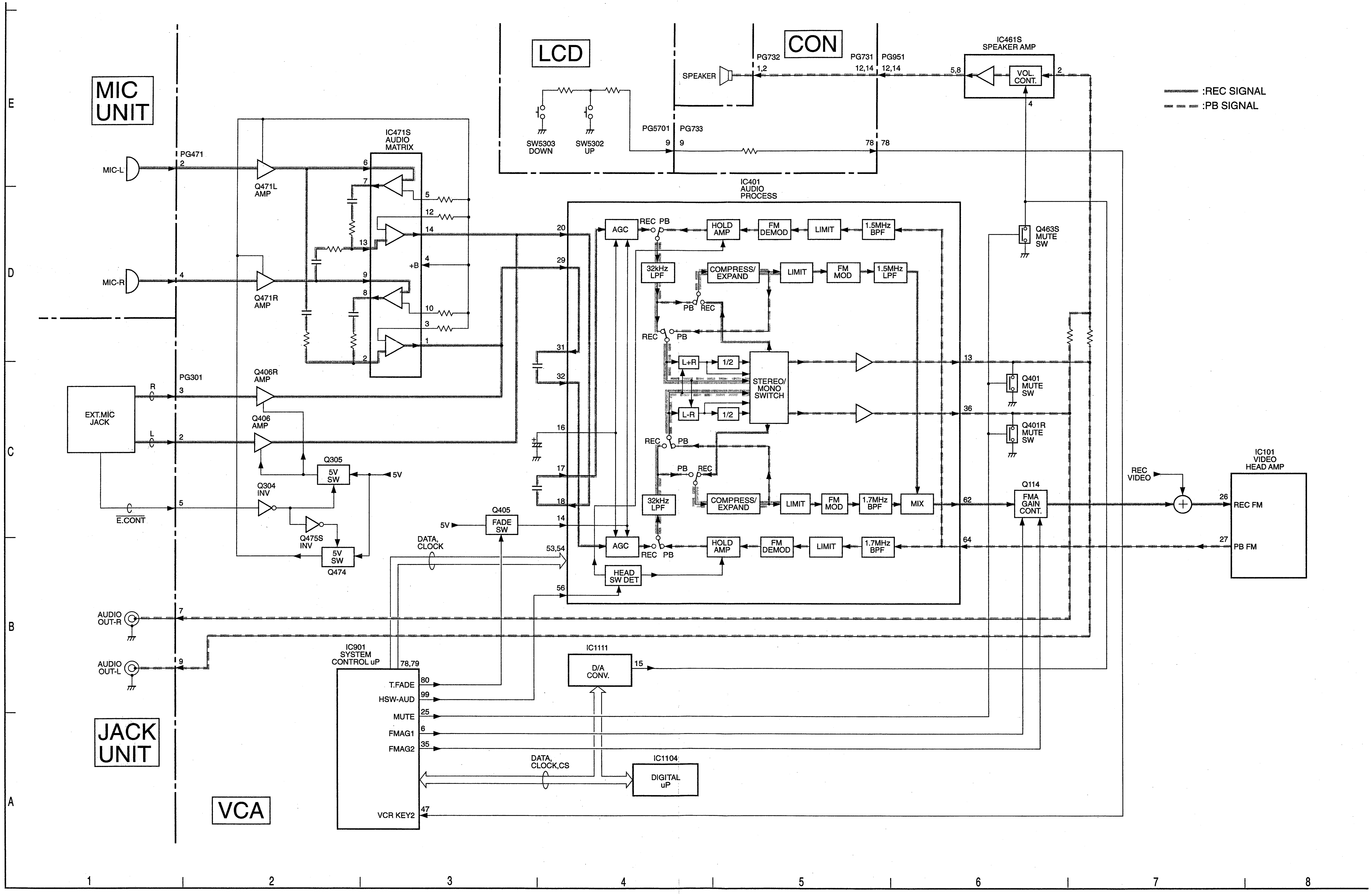


E
D
C
B
A
1
2
3
4
5
6
7
8
CYLINDER
CYL.FG SENSOR
PG603
DRIVE COIL
V
U
W
IC631 CYL. MOTOR DRIVE
V.REF
AMP
MOTOR DRIVE
CYL. FG(DFG)
16,17
Q561
+B(CYL) SW
IC551(1/2) PWM
+B(CYL) PWM
R694-R696, C694-C696
NOISE FILTER
IC901 SYSTEM CONTROL uP
CYL. SPEED
CAPST SPEED
REC CAPST. PHASE
CYL. PHASE
REC
PB
PB CAPST. PHASE
TBC CONT.
C.REVERSE
C.STANDBY
DATA, CLOCK, CS
43-45
60
65
68,75
CAPST FG(CFG)
R691-R693, C691-C693
NOISE FILTER
IC551(1/2) PWM
+B(CAPST) PWM
Q562
+B(CAPST) SW
IC651 CAPST.MOTOR DRIVE
PG602
MR SENSOR
MOTOR DRIVE
REVERSE
ROTOR POSITION SENSOR
U
V
W
CAPSTAN MOTOR
VCA
IC1104 DIGITAL uP
IC1105 EEP-ROM
IC201 VIDEO DSP
FM MOD
REC Y
DATA, CLOCK, CS
47-49, 52,54
AFT CONT.
REC PILOT
PB PILOT
D/A
REC CHROMA
REC AUDIO
L211,C234, C237
Y FILTER
Q202 BUF
L270,C230
CHROMA FILTER
REC EQ
Q204
IC101 VIDEO HEAD AMP
PG101
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
Lo
Hi
SW30/25
Q111 BUF
L105,C126
FILTER
Q112 BUF
Q113
PB EQ
Q115
PB EQ

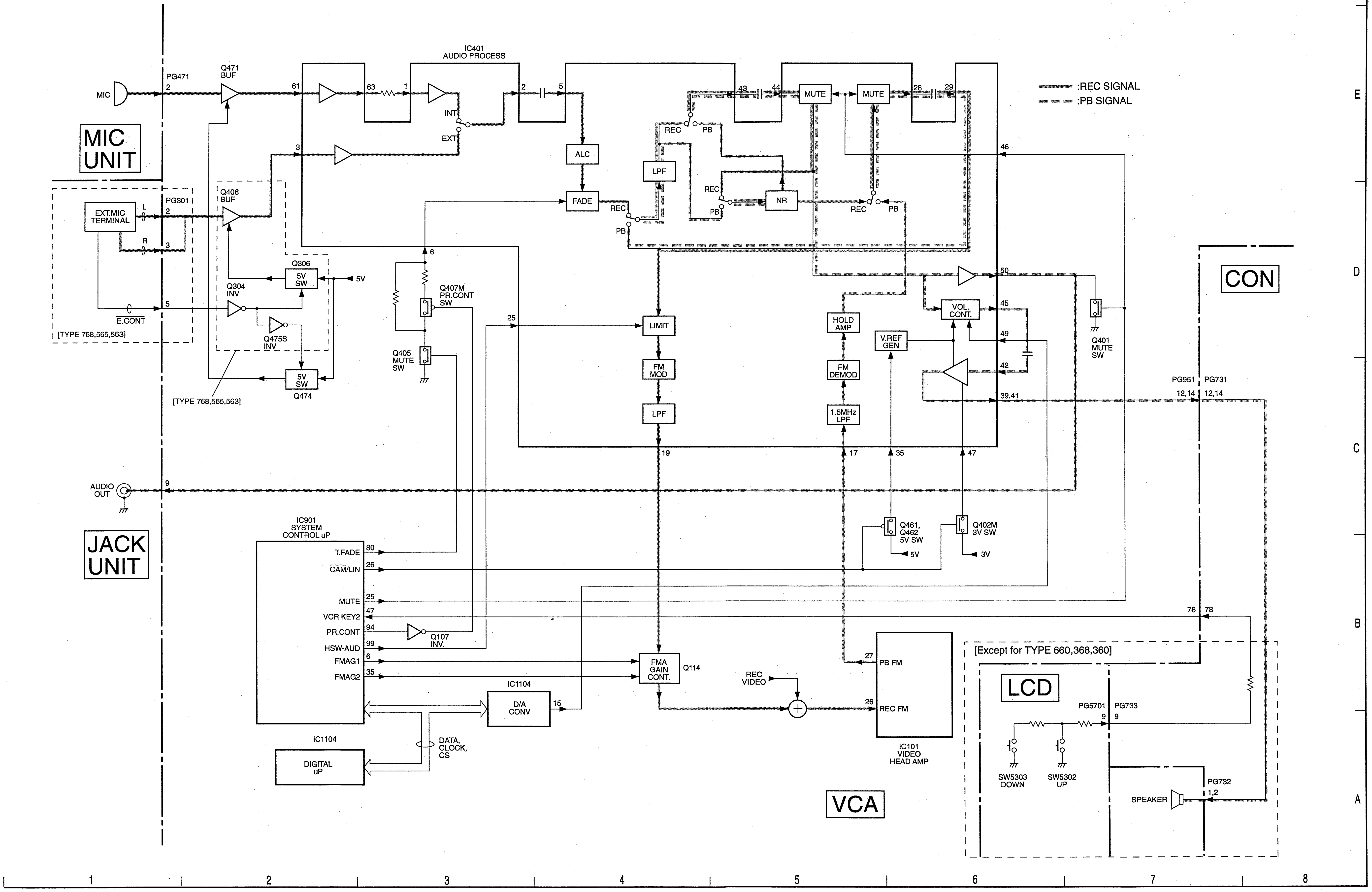
4. CAMERA & VIDEO PROCESS BLOCK DIAGRAM


SE
PG1001
PG201
IC1001 CCD SENSOR
Q1001 BUF
IC202 CDS/AGC & A/D CONV.
CDS
AGC
A/D
RG,H1, H2
SUB, V1-V4
ADCK,SP1, SP2,OBP
CS,CLOCK, DATA
IC203 SENSOR DRIVE
SENSOR DRIVE
XV1-XV4, XSG1,XSG2, XSUB
IC201 VIDEO DSP
Y/CHROMA SIGNAL PROCESS
AUTO FOCUS DET
DIGITAL ZOOM/ EFFECT CONTROL
PULSE GEN.
LCD DRIVE PULSE GEN.
D/A
R/G/B SIGNAL PROCESS
REC Y PROCESS
D/A
FM MOD
REC/PB CHROMA PROCESS
FM DEMOD
A/D
PB Y PROCESS
ATF
EE
KEY AF
KEY 3(0.1)
KEY 1(0.1)
CHARA 1(0-3),
CHARA 2(0-3)
LD
DATA, CLOCK
IC1403 GYRO AMP
NFB
IC1401
H-MOVE
IC1402
V-MOVE
Q1402(1/2) RESET SW
Q1402(2/2) RESET SW
Q1401 INV.
[TYPE 768,765,665,565]
Q202 BUF
L211,C234, C237
Y FILTER
L270, C230
CHROMA FILTER
Q204
REC EQ
REC AUDIO
IC101 VIDEO HEAD AMP
FM AGC
FM PHASE EQ
L105, C126
FILTER
Q111 BUF
Q112 BUF
L106,L107, C134,C135
CHROMA FILTER
PB EQ
Q113
Q115
PB EQ
Q117,Q109, Q110 BUF
PB FM
Lo
Hi
PG101
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
CH2 REC
CH1 REC
Q101-Q103 REC SW
SW30/25
IC301 VIDEO AMP
Q201 BUF
Q210 BUF
OSD MIX
Y/C MIX
OSD DATA
C210,C227 R221,R258
BPF
PG301
PG2001
[TYPE 768,765,665,660]
S-TERMINAL
VIDEO OUT
EVF VIDEO
JACK UNIT
Q350 BUF
Q351 BUF
Q352 BUF
IC350 RGB AMP
Drv(8)
PG951
PG731
PG735
EVF VIDEO PROCESS
CRT
EVF UNIT
PG733
PG5701
PG5303
LCD MODULE
CLD
PG734
PG5302
COM OUT
[Except for TYPE 660,368,360]
CON
LCD
PG905 TEST PLUG
V. OUT
SD
RD
PG1301
IRIS
Q1202 Q1203
IRIS DRIVE
HALL DEVICE
IC1201 F. DET/IRIS DRIVE
F. DET
BIAS
Q1201
BIAS DRIVE
VCA
IC1104 DIGITAL µP
EP, FP
FV, HD
CLOCK, DATA, CS
V-MOVE
H-MOVE
GYRO-RESET
IRIS-PWM
HAL-ADJ1
FDET.
HALL-G
HALL-ADJ0
LD-DSP
DATA, CLOCK
CS-EE
CS-DAC
D-STB
IC1105 EEP-ROM
IC1111 D/A CONV.
COM CTL
COM DC
IC901 SYSEM CONTROL µP
CS-SYC.
OSD CS
IC904 CHARA GEN.
V. SYNC, H. SYNC
BLK 1
VC 1
BLK 2
VC 2
BLK RGB
VR
VG
VB
:REC SIGNAL
:PB SIGNAL
A
B
C
D
E
1
2
3
4
5
6
7
8

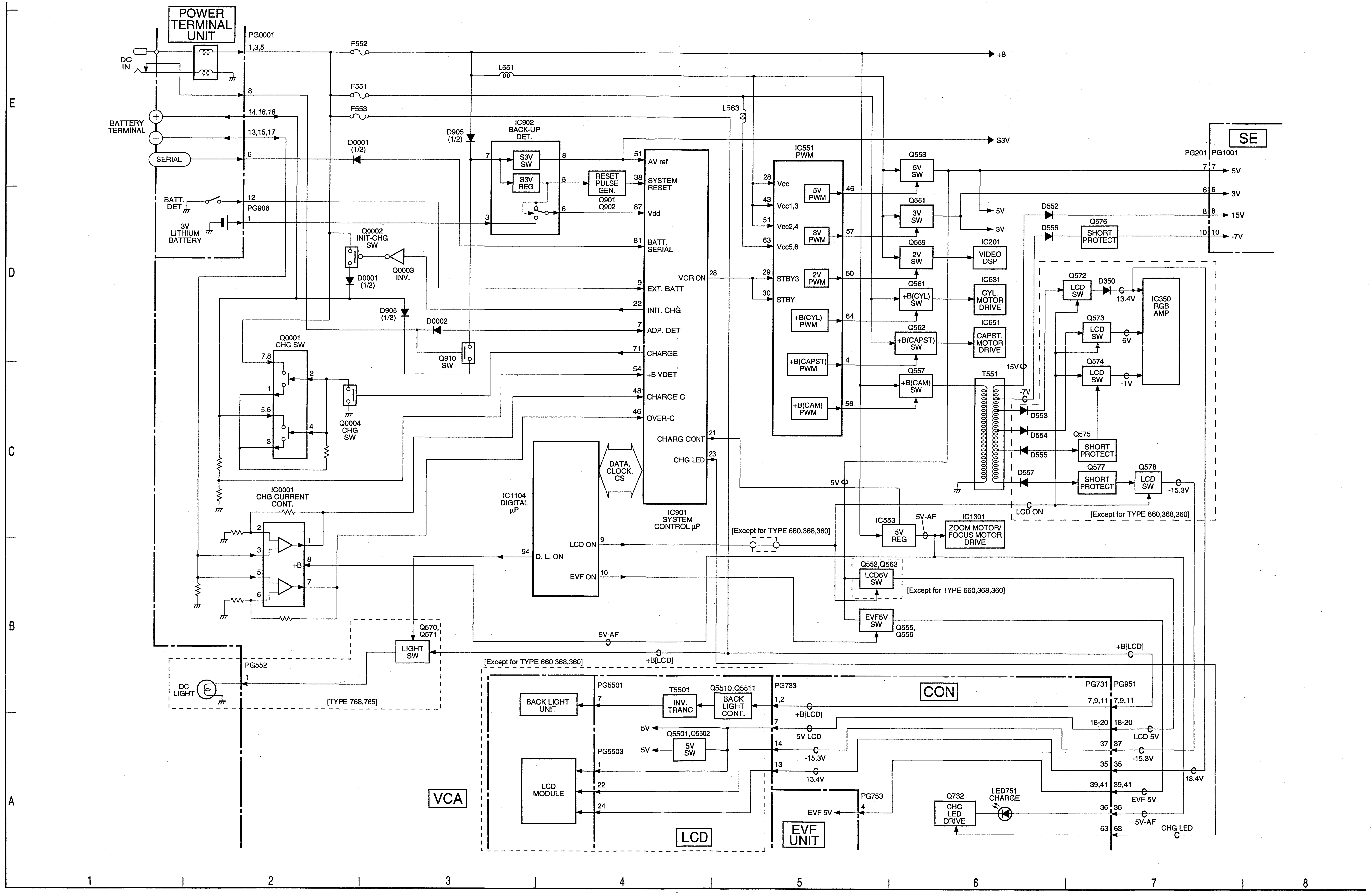
5. AUDIO -STEREO- BLOCK DIAGRAM [TYPE 765/665]


MIC UNIT
LCD
CON
JACK UNIT
VCA
:REC SIGNAL
:PB SIGNAL
MIC-L
MIC-R
PG471
Q471L AMP
Q471R AMP
IC471S AUDIO MATRIX
+B
PG301
EXT.MIC JACK
E.CONT
Q406R AMP
Q406 AMP
Q305 5V SW
5V
Q304 INV
Q475S INV
5V SW
Q474
Q405 FADE SW
DATA, CLOCK
SW5303 DOWN
SW5302 UP
PG5701
PG733
PG732
SPEAKER
PG731
PG951
IC461S SPEAKER AMP
VOL. CONT.
IC401 AUDIO PROCESS
AGC
REC PB
HOLD AMP
FM DEMOD
LIMIT
1.5MHz BPF
32kHz LPF
COMPRESS/ EXPAND
FM MOD
1.5MHz LPF
L+R
L-R
1/2
STEREO/ MONO SWITCH
1.7MHz BPF
MIX
HEAD SW DET
Q463S MUTE SW
Q401 MUTE SW
Q401R MUTE SW
Q114 FMA GAIN CONT.
REC VIDEO
IC101 VIDEO HEAD AMP
REC FM
PB FM
AUDIO OUT-R
AUDIO OUT-L
IC901 SYSTEM CONTROL uP
T.FADE
HSW-AUD
MUTE
FMAG1
FMAG2
VCR KEY2
IC1111 D/A CONV.
DATA, CLOCK,CS
IC1104 DIGITAL uP
A
B
C
D
E
1
2
3
4
5
6
7
8

6. AUDIO -MONAURAL- BLOCK DIAGRAM [TYPE 768/660/568/565/563/368/360]


MIC UNIT
MIC
PG471
Q471 BUF
IC401 AUDIO PROCESS
INT
EXT
ALC
FADE
LPF
REC
PB
MUTE
NR
HOLD AMP
FM DEMOD
1.5MHz LPF
V.REF GEN
VOL. CONT.
LIMIT
FM MOD
— :REC SIGNAL
- - :PB SIGNAL
EXT.MIC TERMINAL
PG301
L
R
E.CONT
[TYPE 768,565,563]
Q406 BUF
Q306 5V SW
Q304 INV
Q475S INV
Q474 5V SW
5V
Q407M PR.CONT SW
Q405 MUTE SW
Q401 MUTE SW
CON
PG951
PG731
AUDIO OUT
JACK UNIT
IC901 SYSTEM CONTROL uP
T.FADE
CAM/LIN
MUTE
VCR KEY2
PR.CONT
HSW-AUD
FMAG1
FMAG2
Q107 INV.
IC1104
D/A CONV
DIGITAL uP
DATA, CLOCK, CS
FMA GAIN CONT.
Q114
REC VIDEO
PB FM
REC FM
IC101 VIDEO HEAD AMP
Q461, Q462 5V SW
Q402M 3V SW
3V
VCA
[Except for TYPE 660,368,360]
LCD
PG5701
PG733
SW5303 DOWN
SW5302 UP
SPEAKER
PG732
A
B
C
D
E
1
2
3
4
5
6
7
8

7. POWER BLOCK DIAGRAM


POWER TERMINAL UNIT
PG0001
1,3,5
DC IN
8
BATTERY TERMINAL
14,16,18
13,15,17
SERIAL
6
BATT. DET
12
PG906
3V LITHIUM BATTERY
1
F552
L551
F551
F553
L563
+B
S3V
D0001 (1/2)
D905 (1/2)
IC902 BACK-UP DET.
S3V SW
S3V REG
7
8
5
6
3
RESET PULSE GEN.
Q901 Q902
51
AV ref
38
SYSTEM RESET
87
Vdd
81
BATT. SERIAL
Q0002 INIT-CHG SW
Q0003 INV.
D0001 (1/2)
D905 (1/2)
D0002
Q910 SW
9
EXT. BATT
22
INIT. CHG
7
ADP. DET
71
CHARGE
54
+B VDET
48
CHARGE C
46
OVER-C
VCR ON
28
21
CHARG CONT
23
CHG LED
IC901 SYSTEM CONTROL µP
Q0001 CHG SW
7,8
1
2
5,6
3
4
Q0004 CHG SW
IC0001 CHG CURRENT CONT.
2
1
3
8
+B
5
7
6
IC1104 DIGITAL µP
DATA, CLOCK, CS
LCD ON
9
94
D. L. ON
EVF ON
10
Q570, Q571
LIGHT SW
5V-AF
+B[LCD]
[Except for TYPE 660,368,360]
PG552
DC LIGHT
[TYPE 768,765]
IC551 PWM
28
Vcc
43
Vcc1,3
51
Vcc2,4
63
Vcc5,6
29
STBY3
30
STBY
5V PWM
46
3V PWM
57
2V PWM
50
+B(CYL) PWM
64
+B(CAPST) PWM
4
+B(CAM) PWM
56
Q553
5V SW
Q551
3V SW
Q559
2V SW
Q561
+B(CYL) SW
Q562
+B(CAPST) SW
Q557
+B(CAM) SW
5V
3V
IC201 VIDEO DSP
IC631 CYL. MOTOR DRIVE
IC651 CAPST. MOTOR DRIVE
T551
15V
-7V
D552
D556
Q576
SHORT PROTECT
PG201
PG1001
SE
7 7
5V
6 6
3V
8 8
15V
10 10
-7V
Q572
LCD SW
D350
13.4V
IC350 RGB AMP
Q573
LCD SW
6V
Q574
LCD SW
-1V
D553
D554
D555
Q575
SHORT PROTECT
D557
Q577
SHORT PROTECT
Q578
LCD SW
-15.3V
LCD ON
[Except for TYPE 660,368,360]
5V
IC553
5V REG
5V-AF
IC1301
ZOOM MOTOR/ FOCUS MOTOR DRIVE
[Except for TYPE 660,368,360]
Q552,Q563
LCD5V SW
[Except for TYPE 660,368,360]
EVF5V SW
Q555, Q556
+B[LCD]
[Except for TYPE 660,368,360]
PG5501
BACK LIGHT UNIT
7
T5501
INV. TRANC
Q5510,Q5511
BACK LIGHT CONT.
5V
Q5501,Q5502
PG5503
5V
5V SW
1
22
24
LCD MODULE
VCA
LCD
PG733
1,2
+B[LCD]
7
5V LCD
14
-15.3V
13
13.4V
PG753
EVF 5V
4
EVF UNIT
CON
Q732
CHG LED DRIVE
LED751 CHARGE
PG731
PG951
7,9,11
7,9,11
18-20
18-20
LCD 5V
37
37
-15.3V
35
35
39,41
39,41
EVF 5V
36
36
5V-AF
63
63
CHG LED
13.4V
E
D
C
B
A
1
2
3
4
5
6
7
8

MICROPROCESSOR PIN FUNCTION TABLES

1. Digital Microprocessor (IC1104: D-µP)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	(Pulse)	LD-DSP	Activates data communications with IC201 (VIDEO DSP).
2	O	(Pulse)	CS-DAC	Activates data communications with IC1111 (D/A CONV.).
3	-----	-----	----------	Not used. Open.
4	O	Hi	GYRO-RST	Drives Q1402 (GYRO RESET) via Q1401 (INV.) to reset IC1401 (V-MOVE) and IC1402 (H-MOVE).
5	-----	-----	CEON	Not used. Open.
6	-----	-----	CHARGE	Not used. Open.
7	I	Hi/Lo	LCD-OPEN	Input to discriminate whether of LCD monitor is opened or closed. Hi: Close, Lo: Open.
8	I	Hi/Lo	LCD-REV	Input to discriminate whether of LCD monitor is turned over.
9	O	Hi	LCD-ON	LCD power control output. Outputs "Hi" when power is turned on.
10	O	Hi	EVF-ON	Electronic viewfinder (EVF) power control output. Outputs "Hi" when power is turned on.
11	-----	-----	----------	Not used. Open.
12	-----	-----	VCC	3V power input.
13	I	Lo	BLC	BLC switch detection inputs.
14	-----	-----	GND	Ground.
15	I	Lo	CLOSS-U	Not used.
16	I	Lo	CLOSS-D	
17	I	Lo	CLOSS-L	
18	I	Lo	CLOSS-R	
19	I	Lo	ENTER	
20	-----	-----	----------	Not used. Open.
21	-----	-----	----------	
22	-----	-----	----------	
23	-----	-----	XTAL-CTL	
24	-----	-----	----------	
25	-----	-----	CHECK8	
26	O	Lo	TALLY LED	Drives LED701 (TALLY) via Q701 (TALLY DRIVE) to turn on during recording.
27	-----	-----	REM-CTRL	Not used. Open.
28	-----	(Pulse)	IRIS PWM	Iris motor drive output .
29	-----	-----	LD JIG	Not used. Open.
30	O	(Pulse)	ZDOEB	Activates zoom drive data communications with IC1301 (FOCUS MOTOR/ZOOM MOTOR DRIVE).
31	O	(Pulse)	FOOEB	Activates focus drive data communications with IC1301 (FOCUS MOTOR/ZOOM MOTOR DRIVE).
32	O	(Pulse)	ZOOM-LED	Output pulses to drive the ZOOM LED in the lens block.
33	O	(Pulse)	FCUS-LED	Output pulses to drive the FOCUS LED in the lens block.
34	O	PWM	ZD-PWMB	Outputs zoom motor drive signal to IC1301 (FOCUS MOTOR/ZOOM MOTOR DRIVE).
35	O	PWM	ZD-PWMA	
36	O	PWM	RD-PWMB	Outputs focus motor drive signal to IC1301 (FOCUS MOTOR/ZOOM MOTOR DRIVE).
37	O	PWM	RD-PWMA	
38	I	(Pulse)	FV	Receives the vertical sync pulses that detect the iris detection area, from IC201 (VIDEO DSP).
39	I	(Pulse)	ZOM-SENS	Zoom motor position detection input.
40	I	(Pulse)	REM-IR	Not used. Connect to ground.
41	I	(Pulse)	FUS-SENS	Focus motor position detection input.
42	-----	-----	GND	Ground.
43	O	0V-5V	HAL-ADJ.1	Controls the offset voltage of IC1201 (F.DET/IRIS DRIVE).
44	O	0V-5V	HAL-ADJ0	Drives bias generator in IC1201 (F.DET/IRIS DRIVE) via Q1201 (BIAS DRIVE) to control the bias voltage of the Hall devices.
45	-----	-----	----------	Not used. Open.
46	I	0V-5V	ZOOM-SW	Zoom (TELE/WIDE) switch detection inputs.
47	I	0V-3V	KEY2	Not used.
48	I	0V-3V	KEY1	Operation switch detection input (FADE and D.EFFECTS switche).
49	I	0V-3V	TEMP-ADJ	Temperature change detection input. Detects variations in the forward voltage at the connected diode to correct the back-focus.
50	I	0V-3V	V-GYRO	Receives vertical camera shake correction data from IC1401 (V-MOVE) via IC1403 (GYRO AMP).

Pin No.	I/O	Active Level	Abbreviation	Function
51	I	0V-3V	H-GYRO	Receives horizontal camera shake correction data from IC1402 (H-MOVE) via IC1403 (GYRO AMP).
52	I	0V-3V	FDET	F-value detection input. Receives the F.DET voltage detected by IC1201 (F.DET/IRIS DRIVE) and compares this with the reference voltage input via pin 53 to detect the F-value.
53	-----	-----	AVCC	Reference 3V power input.
54	-----	-----	AVCC	A/D reference voltage input (connected to 3V power supply).
55	-----	-----	VCC	3V power input.
56	-----	-----	VCC	
57	-----	-----	----------	Not used. Open.
58	-----	-----	----------	
59	I	Lo	SYS-REST	Reset signal input from IC901 (S-µP).
60	-----	-----	VCC	3V power input.
61	-----	-----	STBY	Not used. Connect to 3V power supply.
62	-----	-----	VCC	3V power input.
63	-----	-----	----------	Not used. Open.
64	-----	-----	GND	Grounded.
65	I	(Pulse)	SYS-CLOCK	Inputs control clock pulses from IC201 (VIDEO DISITAL PROCESS).
66	-----	-----	---------	Not used. Connect to 3V power supply.
67	-----	-----	VCC	3V power input.
68	-----	-----	----------	Not used. Open.
69	O	Hi	HALL-G	Controls the amplification (gain of Hall device) of IC1201 (F.DET/IRIS DRIVE).
70	-----	-----	----------	Not used. Open.
71	-----	-----	----------	
72	I	(Pulse)	HD	Input horizontal sync pulse from IC201 (VIDEO DIGITAL PROCESS).
73	-----	-----	SHUT-CTL	Not used. Open.
74	-----	-----	STROBE	
75	I	(Pulse)	FP	Input field discrimination pulse from IC201 (VIDEO DIGITAL PROCESS).
76	O	(Pulse)	SD (232C)	Used for initial settings and adjustment. For data communications with personal computer.
77	I	(Pulse)	RD (232C)	
78	I	(Pulse)	EP3/AFLH	Receives pulses which discriminate the iris detection area.
79	O	(Pulse)	SDO	For data communications with IC201 (VIDEO DSP), IC1105 (EEP-ROM), IC901(SYSTEM CONTROL µP) and IC1111 (D/A CONV.).
80	I	(Pulse)	SDI	
81	O	(Pulse)	SCLK	
82	-----	-----	----------	Not used. Open.
83	-----	-----	----------	
84	-----	-----	----------	
85	-----	-----	----------	
86	I	Hi	DCL-AUTO	Input to detect the AUTO position of DC light switch. If IC1104 detects the AUTO position (Hi), it switches the voltage at pin 94 according to the surrounding brightness.
87	-----	-----	----------	Not used. Open.
88	-----	-----	----------	Not used. Connected to ground.
89	-----	-----	LIGHT-SW	Input to detect the ON position of DC light switch. If IC1104 detects the ON position (Hi), it sets the voltage at pin 94 to "HI".
90	I	Hi	PB-HIBAD	Playback mode detection input. IC1104 receives the playback mode detection signal sensed by IC201 (VIDEO DSP) and instructs IC904 (CHARA. GEN.) to generate the display signals and also transfers the operation mode data toIC201. Open for models with which only normal tapes are used.
91	-----	-----	----------	Not used. Open.
92	I	Lo	NEAR-SW	Manual focus switche (FOCUS-N/FOCUS-F) detection inputs.
93	I	Lo	FAR-SW	
94	-----	-----	LIGHT-ON	DC light power control output. This outputs "Hi" according to the voltage input to pin 86 or 89, and drive Q570 and Q571 to turn the DC light on.
95	-----	-----	SCRN-ON	Not used. Open.
96	O	(Pulse)	CLK-CDS	Transfer data to IC202 (CDS/AGC & A/D CONV.).
97	O	(Pulse)	SDO-CDS	
98	O	(Pulse)	CS-CDS	Activates data communications with IC202 (CDS/AGC & A/D CONV.).
99	O	(Pulse)	CS-EE	Activates data communications with IC1105 (EEP-ROM).
100	O	(Pulse)	CS-SYS	Activates data communications with IC901 (SYSTEM CONTROL µP).

Pin No.	I/O	Active Level	Abbreviation	Function
42	I	(Pulse)	CS-SYC(CAM)	Activates data communications with IC1104 (DIGITAL µP).
43	I	(Pulse)	C-S DATA(CAM)	For data communications with IC201 (VIDEO DSP), IC1105 (EEP-ROM), IC1104 (DIGITAL µP) and IC1111 (D/A CONV.).
44	O	(Pulse)	S-C DATA(CAM)	
45	I	(Pulse)	C LOCK(CAM)	
46	I	0V-3V	OVER-C	Overcurrent detection input during charging. Changes the gain during charging to monitor the charge current.
47	I	0V-3V	VCR KEY2	VCR operation switch detection input (PLAY, DATE, TITLE and MUTE etc.).
48	I	0V-3V	CHARGE C	Charge current detection input. Monitors the charge current during charging.
49	I	0V-3V	BATTERY	Input to detect the battery remaining level.
50	-----	-----	GND	Grounded.
51	I	-----	AVref	Reference voltage input. Connect to 3V line.
52	-----	-----	AVdd	3V power input.
53	I	Hi/Lo	CASETTE-SW	Erase prevention tab and Hi-8/Normal of the casette detection input.
54	I	0V-3V	+B VDET	Battery voltage detection input. Monitors the attached battery voltage.
55	I	Lo	EXT MIC	External microphone connect detection input.
56	I	0V-3V	VCR KEY1	VCR operation switch detection input (REW, F.FWD and STOP).
57	I	0V-3V	TRACK ADJ.	For the connection of a tracking control for adjustment. When an ATF-R jig is connected to PG601 (test plug), the variable resistor on the ATF-R jig can be used as a tracking control.
58	I	(Pulse)	EST	Take-up tape end detection input.
59	I	(Pulse)	ESS	Supply tape end detection input.
60	I	(Pulse)	ENV DET	Playback (PB) FM signal input.
61	I	(Pulse)	RSS	Supply/take-up reel sensor inputs. Used to calculate the remaining tape and to detect reel lock.
62	I	(Pulse)	RST	
63	-----	-----	GND	Grounded.
64	I	(Pulse)	C.SYNC	Composite sync signal input. The separated vertical sync signal is divided by two to generate the 1/2V.SYNC pulse which is used to control the cylinder speed during recording (reference signal).
65	I	(Pulse)	TBC CONT	Cylinder phase control signal input.
66	-----	-----	GND	Grounded.
67	I	(Pulse)	DFG	Cylinder FG (CYL. FG) pulse input. Controls the cylinder speed during recording and playback.
68	I	(Pulse)	CFG	Capstan FG (CAPST.FG) pulse input. Controls the capstan speed and used for counting of the linear time counter and recording restart control (assemble recording).
75	I	(Pulse)	CFG	
69	O	Hi	LOAD	Loading motor drive outputs.
70	O	Hi	UNLOAD	
71	O	Hi	CHARGE	Charge circuit control output. Outputs "Hi" during charging to activate the charge circuit.
72	O	(Pulse)	OSD CS	Activates communications with IC904 (CHARA. GEN.).
73	O	PWM	D.SPEED	Cylinder servo control outputs.
74	O	PWM	C.SPEED	Capstan servo control outputs.
76	I	Lo	V-DET[Lo]	Inputs whether a battery is attached or not. "Lo" is input when the battery is detached, to shift the microprocessor to the backup mode in which the data is saved.
77	I	Hi	DC900DET	Not used.
78	O	(Pulse)	D. OUT	For data communications with IC904 (CHARA. GEN.) and IC401 (AUDIO PROCESS (For stereo type)).
79	O	(Pulse)	CLOCK	
80	O	Hi	T.FADE	Rapid audio fading output. Outputs "Hi" when fading is started to fade the audio signal in rapidly.
81	I	Hi/Lo	BATT. SERIAL	Battery serial time detection input.
82	-----	-----	----------	Not used. Open.
83	I	(Pulse)	REMOCON	Remote operation signal input from the infrared receiver.
84	I	(Pulse)	32kHz TEX IN	Generate 32kHz sub-clock pulses.
85	O	(Pulse)	32kHz TX OUT	
86	-----	-----	GND	Ground.
87	-----	-----	Vdd	3V power input.
88	-----	-----	----------	Not used. Connected to 3V line.
89	-----	-----	----------	Not used. Open
90	O	Hi	C.REVERSE	Capstan motor reversing control output.

2. System Control Microprocessor (IC901: S-µP)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	Lo	CH2. REC[Lo]	Output the signals to select the video heads for recording.
2	O	Lo	CH1. REC[Lo]	Go "Lo" in the corresponding channel period during recording.
3	O	(Pulse)	SW30[Lo]	Antiphase head switching pulse output.
4	O	(Pulse)	SW30(SW25)	Head switching pulse output.
5	I	Hi	TEST/NOR[Lo]	Test program start detection input. A test program is executed when "Hi" is input.
6	O	Hi	FMAG1	Q114 (FM AGC) control outputs. Q114 aligns the REC AUDIO signal (FMA) level with the REC VIDEO signal level that varies.
35	O	Hi	FMAG2	
7	I	Hi	ADP DET	AC adapter connection detection input.
8	I	Hi/Lo	PRE V	Lithium battery attachment and voltage detection input. (Not attached or less than 2.5V: Hi, Attathed: Lo)
9	I	Lo	EXT BATT	Battery attachment detection input.
10	I	0V-3V	M-SW2	Mechanism state switch position (mode) detection input.
11	I	0V-3V	M-SW1	
12	I	0V-3V	M-SW0	
13	I	Lo	CAM SW[Lo]	Power switch detection input. "Lo" is input during recording (CAMERA mode).
14	I	Lo	VCR SW[Lo]	Power switch detection input. "Lo" is input during playback (PLAY mode).
15	I	Lo	EJECT SW[Lo]	Eject switch detection input. When "Lo" is input, the camera/recorder performs the eject operation even when the power is turned off (standby release input).
16	I	Lo	STAGE[Lo]	Cassette holder open/close detection input. "Lo" is input when the cassette holder is closed.
17	I	Hi/Lo	ME/MP[Lo]	Input to discriminate the type of tape. Hi: ME (metal evaporated) tape, Lo: MP (metal particle) tape.
18	I	Lo	WAKE UP[Lo]	Standby release input. When the camera power is turned on, "Lo" is input to release the standby mode. IC901 detects the inputs of each switch to start operation.
19	I	Lo	REC START[Lo]	Recording start/stop switch detection input.
20	-----	-----	----------	Not used. Open.
21	O	Hi	CHARGE CONT	Controls IC553 (5V REG) to generate autofocus and charge circuits power supply 5V(AF).
22	O	Hi	INIT CHG	Charge mode control output. Outputs "Hi" when the voltage of the attached battery is 5.8V or less, to set the camcorder to the initial charge mode.
23	O	Hi	CHG LED	Outputs "Hi" during charging to control Q732 (CHG LED DRIVE) so that the CHARGE LED (LED751) lights.
24	-----	-----	----------	Not used.
25	O	Hi	MUTE	Audio muting output. Outputs "Hi" to mute sound.
26	O	Hi/Lo	CAM[Lo]/LINE	Video processor mode control output. Outputs "Lo" during camera recording and "Hi" with an external (line) signal.
27	O	(Pulse)	END LED	End LED drive output. Outputs pulses of approx. 50Hz when power is turned on.
28	O	Hi	VCR ON	Power control output. Outputs "Hi" when power is turned on.
29	O	Lo	CAM+OSD RESET[Lo]	Outputs "Lo" with power on and is set to open with power off to initialize IC1104 (DIGITAL µ P) and IC904 (CHARA. GEN.).
30	O	(Pulse)	CEVF-CS	Not used.
31	O	Hi	C.STANDBY	Capstan motor power control output.
32	O	Hi/Lo	ZONE. OFF	Not used.
33	O	Hi	Hi-8 ET	Not used.
34	O	Lo	DSP RESET [Lo]	Outputs "Lo" with power on and is set to open with power off to initialize IC201 (VIDEO DSP).
36	-----	-----	----------	Not used. Open.
37	-----	-----	GND	Grounded.
38	I	Lo	SYSTEM RESET[Lo]	Microprocessor reset input. "Lo" input resets the microprocessor.
39	-----	-----	GND	Grounded.
40	O	(Pulse)	XTAL OUT 12MHz	Drive X901 to generate 12MHz main clock pulses.
41	I	(Pulse)	EXTAL IN 12MHz	

CHAPTER 7 APPENDIX

1. SELF-DIAGNOSTIC FUNCTION

1. 1 Overview

The camera/recorder has the following self-diagnostic function.

- Occasional defect self-diagnostic function (A mode)
- Mechanical block self-diagnostic function (B mode)

Fig. 1-1 shows the self-diagnostic coverage range.
The self-diagnostic functions of the camera/recorder are engaged by the system control (S) µP (IC0901) which detects, memorizes and displays data related to defects in the mechanical block control system.

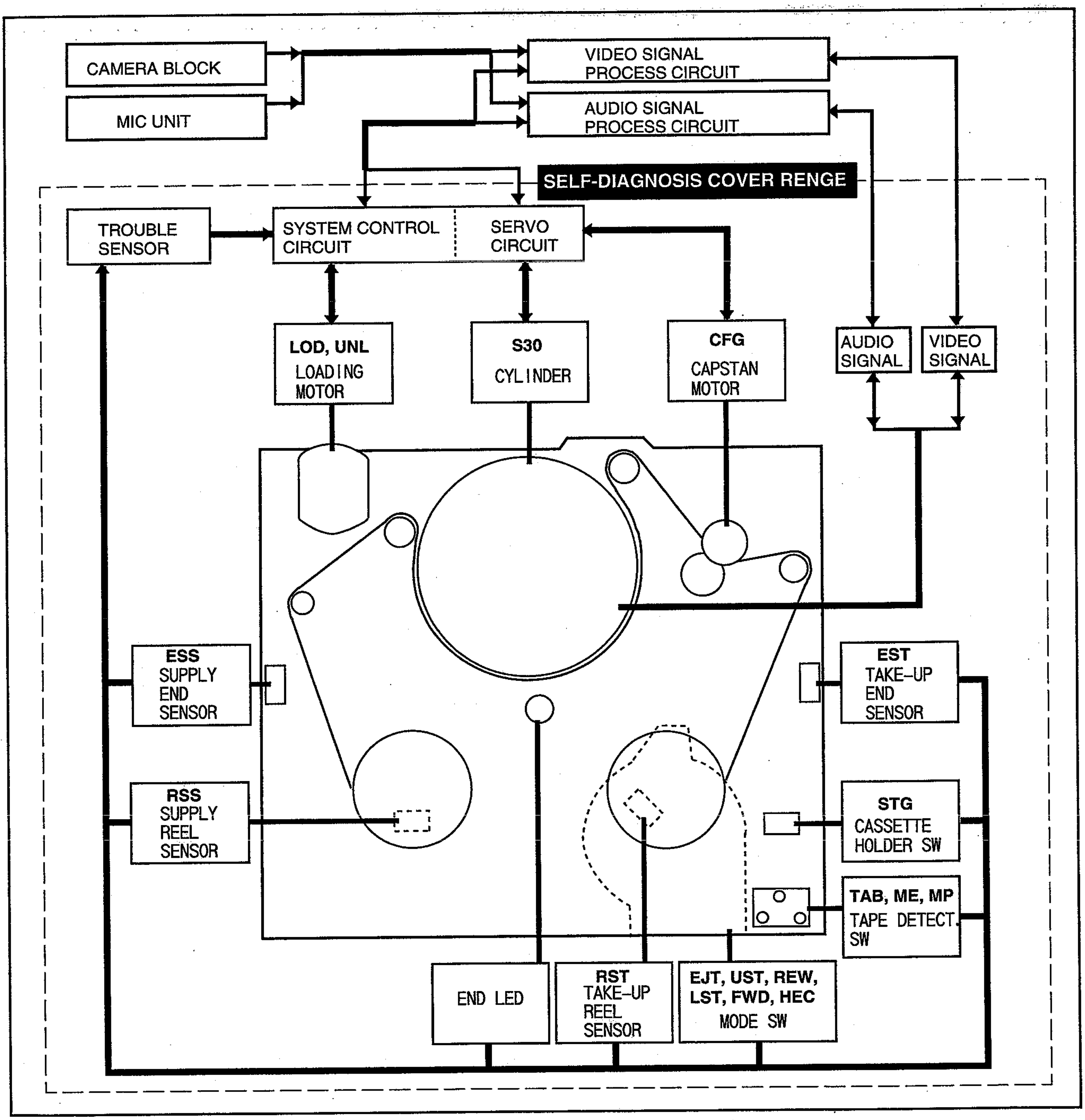

CAMERA BLOCK
MIC UNIT
VIDEO SIGNAL PROCESS CIRCUIT
AUDIO SIGNAL PROCESS CIRCUIT
SELF-DIAGNOSIS COVER RENGE
TROUBLE SENSOR
SYSTEM CONTROL CIRCUIT
SERVO CIRCUIT
LOD, UNL LOADING MOTOR
S30 CYLINDER
CFG CAPSTAN MOTOR
AUDIO SIGNAL
VIDEO SIGNAL
ESS SUPPLY END SENSOR
EST TAKE-UP END SENSOR
RSS SUPPLY REEL SENSOR
STG CASSETTE HOLDER SW
TAB, ME, MP TAPE DETECT SW
END LED
RST TAKE-UP REEL SENSOR
EJT, UST, REW, LST, FWD, HEC MODE SW

Fig. 1-1 Self-Diagnostic Coverage Range

Pin No.	I/O	Active Level	Abbreviation	Function
91	O	Hi	REC	Output to control the video processor during recording.
92	O	Hi/Lo	PB	Output to control the video processor mode. Goes "Hi" during playback.
93	O	Hi	D.STANDBY	Cylinder motor start auxiliary output. Outputs "Hi" for 50 ms when the motor is started in the forward rotation direction.
94	O	Lo	PR.CONT	Preamp activation signal. Outputs"Hi" during playback to activate the preamp.
95	O	(Pulse)	HD	Artificial H. sync signal output.
96	O	(Pulse)	ADDV+ SQUELCH	Artificial V. sync signal + video muting signal output.
97	O	Hi/Lo	WIPE CONT	Output to select the display mode (normal or 16x9 (wide vision)).
98	O	Hi/Lo	LCD-HOLD	Controls the LCD control circuit operation mode.
99	O	(Pulse)	AUDIO30(25)	Outputs switching pulses to IC401 (AUDIO PROCESS).
100	O	Hi	FE CONT	Flying erase head oscillation control output .

1.2 Details of Display/Detection and Applications

Table 1-1 summarizes the details of display/detection of the self-diagnostic functions and their applications.

Fig. 1-2 shows the operational processes of the self-diagnostic functions.

Table 1-1 Details of Display/Detection of Self-Diagnostic Functions and their Applications

	Occasional defect self-diagnostic function (A mode)	**Mechanical block self-diagnostic function (B mode)**
Details of display/ detection	The system control μP memorizes and displays the defect data. (If several defects have occurred, only the last defect detected is memorized.)	Displays the data for the defect that has occurred when the B mode is set.
Application	Used when the defective symptom is not reproduced during servicing.	Used to detect the cause of the defect (in the mechanical block or electrical circuits) and to determine the defective position of the mechanical block.
Detected parts	Trouble sensors • Take-up end sensor (EST) • Supply end sensor (ESS) • Take-up reel sensor (RST) • Supply reel sensor (RSS) Cylinder (S30) Capstan motor (CFG)	Trouble sensors • Take-up end sensor (EST) • Supply end sensor (ESS) • Take-up reel sensor (RST) • Supply reel sensor (RSS) Cylinder (S30) Capstan motor (CFG) Loading motor (LOD, UNL) Mechanism mode switch (EJT, UST, REW, LST, FWD, HEC) Tape detection switches, etc. • Erase prevention tab detection switch (TAB) • ME/MP detection switch (ME) • Hi-8 MP detection switch (MP) • Cassette holder switch (STG)
Cautions	When the rewind mode is entered, the defect data is erased.	Engage the B mode after completing the A mode. If the B mode is engaged first, the defect data may be erased.

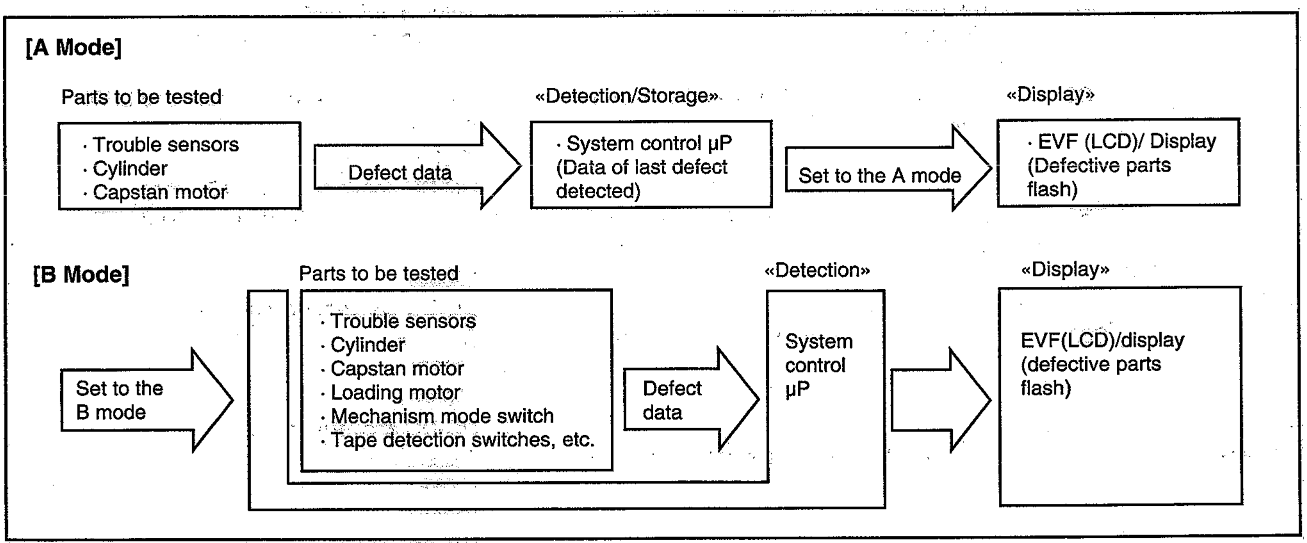

[A Mode]
Parts to be tested
· Trouble sensors
· Cylinder
· Capstan motor
Defect data
«Detection/Storage»
· System control μP
(Data of last defect detected)
Set to the A mode
«Display»
· EVF (LCD)/ Display
(Defective parts flash)
[B Mode]
Set to the B mode
Parts to be tested
· Trouble sensors
· Cylinder
· Capstan motor
· Loading motor
· Mechanism mode switch
· Tape detection switches, etc.
Defect data
«Detection»
System control μP
«Display»
EVF(LCD)/display
(defective parts flash)

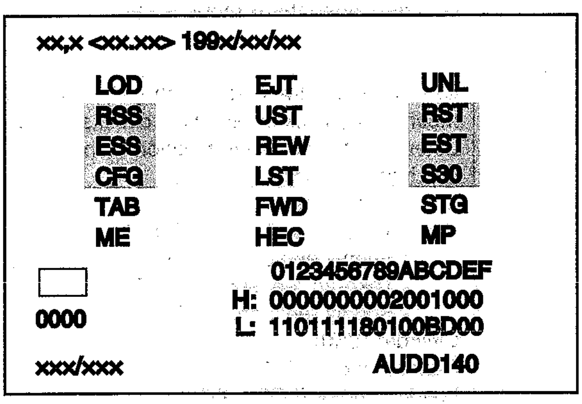
Fig. 1-2 Oeration Processes of Self-Diagnostic Functions

1.3 Setting Procedure and Details of Diagnosis

1.3.1 Occasional Defect Self-Diagnostic Function (A Mode)

(1) Setting Procedure

1) Connect (attach) a power supply (battery).
2) Set the CAM/OFF/VIDEO switch to"VIDEO".
3) Press the DATE button. [Within half a second]
4) Press the DATE and REW buttons simultaneously and hold them for 3-5 seconds.



```
xx,x <xx.xx> 199x/xx/xx

      LOD            EJT            UNL
      RSS            UST            RST
      ESS            REW            EST
      CFG            LST            S30
      TAB            FWD            STG
      ME             HEC            MP
                        0123456789ABCDEF
 ☐                   H: 0000000002001000
 0000                L: 110111180100BD00

 xxx/xxx                         AUDD140
```

«Results of self-diagnosis»

- The shaded items flash if they are defective.
- See Table 1-2 for the results of diagnosis.

Cautions:

- Do not press any buttons other than those specified during self-diagnosis; otherwise, it may cause a malfunction.
- Only the shaded items are tested in the A mode.
- Other items are ignored.

[To release]

- Set the CAM/OFF/VIDEO switch to "OFF".
- Press the DATE and REW buttons simultaneously.

(2) Results of Diagnosis

Table 1-2 summarizes the results of diagnosis and the circuits/parts deemed to be defective in the A mode.

Table 1-2 Details of A Mode Self-Diagnosis

Part	Display	Results of diagnosis	Parts/circuits deemed to be defective
Trouble sensors	RSS	The pulse from the supply reel sensor is defective.	Supply reel disk Trouble sensor (reel sensor) IC0901
	RST	The pulse from the take-up reel sensor is defective.	Take-up reel disk Trouble sensor (reel sensor) IC0901
	ESS	The pulse from the supply end sensor is defective.	Trouble sensors (end sensor/end LED) Q0905 IC0901 DC-DC converter circuit (B+ line)
	EST	The pulse from the take-up end sensor is defective.	Trouble sensors (end sensor/end LED) Q0905 IC0901 DC-DC converter circuit (B+ line)
Cylinder	S30	The SW30/25 (CYL. FG) pulse is defective.	Cylinder IC0631 IC0901 DC-DC converter circuit
Capstan	CFG	The CAPST. FG pulse is defective.	Capstan motor IC0651 IC0901 DC-DC converter circuit

1.3.2 Mechanical Block Self-Diagnostic Function (B Mode)

Caution: Complete the A mode before engaging the B mode.

(1) Setting Procedure

1) Connect (attach) a power supply (battery).
2) Press the EJECT switch to set to the eject state.
3) Press the "Hi-8 MP" switch on the trouble sensor and the DATE button and hold them, then set the CAM/OFF/VIDEO switch to "VIDEO" (Hold this state for a few seconds.) [Within 3 seconds].
4) Close the cassette lid.

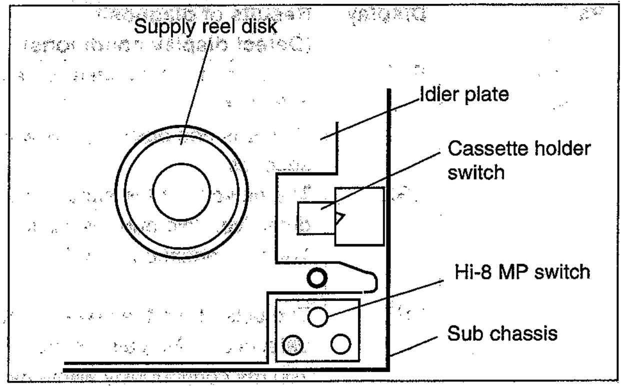
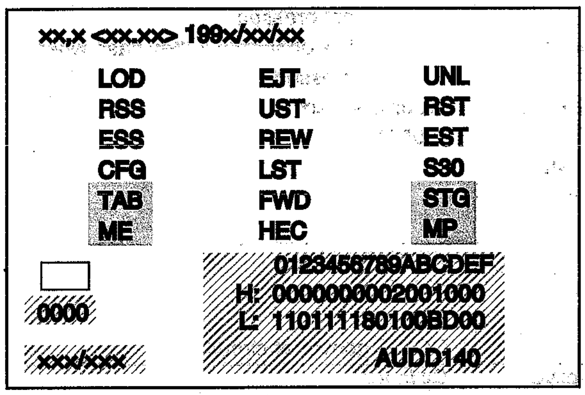


Fig.1-3 Hi-8 MP Switch Position



```
xx,x <xx.xx> 199x/xx/xx
     LOD        EJT        UNL
     RSS        UST        RST
     ESS        REW        EST
     CFG        LST        S30
     TAB        FWD        STG
     ME         HEC        MP
                   0123456789ABCDEF
 0000            H: 0000000002001000
                 L: 110111180100BD00
 xxx/xxx                    AUDD140
```

«Results of self-diagnosis»

- The defective items flash.
- The shaded items are the tape detection switches and cassette holder switch which flash when they are not pressed.
- See Table 1-3 for the results of diagnosis.

Cautions:

- Do not press any buttons other than those specified during self-diagnosis; otherwise, it may cause a malfunction.
- The indications in dotted lines are not covered by the self-diagnostic functions.
- It is normal for the diagnostic procedure to end in the eject state. Do not close the cassette lid thereafter.

[To release]

- Set the CAM/OFF/VIDEO switch to "OFF".

5) The procedure ends in the eject state.

Caution: Do not close the cassette lid.

(2) Results of diagnosis

Table 1-3 summarizes the results of diagnosis and the circuits/parts deemed to be defective in the B mode.

Table 1-3 Results of B Mode Self-Diagnosis (1/2)

Part	Display	Results of diagnosis (Detect display conditions)	Parts/circuits deemed to be defective
Loading motor	LOD	The loading motor is defective when running forward. (Does not load within 10 seconds.)	Loading motor Rotation of drive gears in mechanical block faulty. IC0671 IC0901 IC0902 Power supply (5V, B+) lines.
	UNL	The loading motor is defective when runnig in reverse. (Does not unload within 10 seconds.)	
Trouble sensors	RSS	The pulse from the supply reel sensor is defective. (There is one pulse or less withinte two seconds.)	Supply reel disk Trouble sensor (reel sensor) Capstan motor IC0901

Table 1-3 Results of B Mode Self-Diagnosis (2/2)

Part	**Display**	**Results of diagnosis (Detect display conditions)**	**Parts/circuits deemed to be defective**
Trouble sensor	RST	The pulse from the take-up reel sensor is defective. (There is one pulse or less within two seconds.)	Take-up reel disk Trouble sensor (reel sensor) Capstan motor IC0901
	ESS	The pulse from the supply end sensor is defective. (No pulse is input for more than 100 ms continuously within two seconds.)	Trouble sensors (end sensor/end LED) Q0905 IC0901 DC-DC converter circuit (B+ line)
	EST	The pulse from the take-up end sensor is defective. (No pulse is input for more than 100 ms continuously within two seconds.)	Trouble sensors (end sensor/end LED) Q0905 IC0901 DC-DC converter circuit (B+ line)
Tape detection switches, etc.	TAB	The erase prevention tab detection switch detects the record inhibit state (OFF).	**Caution:** These switches flash when they are not pressed. It is abnormal if they flash when pressed. Trouble sensor IC0901
	ME	The ME/MP tape detection switch detects the MP state (OFF).	
	MP	The Hi-8 MP tape detection switch detects the normal MP state (OFF).	
	STG	The cassette holder switch detects the state where the cassette holder is not lowered (OFF).	
Capstan motor	CFG	The CAPST. FG pulse is defective. (150 pulses or less within two seconds.)	Capstan motor IC0651 IC0901 DC-DC converter circuit
Cylinder	S30	The SW30/25 (CYL. FG) pulse is defective. (No pulse is input normally within two seconds.)	Cylinder IC0631 IC0901 DC-DC converter circuit
Mechanism mode switch	UST	The unloading stop position detection signal is defective.	**Caution:** The positions shown on the left are detected in the order described within 10 seconds. Mechanism mode switch Trouble sensor IC0901 Defective rotation/phase of drive gears in mechanical block. Loading motor. Tape transport components. Guide roller rails DC-DC converter circuit.
	REW	The rewind position detection signal is defective.	
	LST	The loading stop position detection signal is defective.	
	FWD	The play or fast forward position detection signal is defective.	
	HEC	Between the fast forward position and unloading stop position detection signal isdefective.	
	EJT	The eject position detection signal is defective.	

2. DEMONSTRATION (DEMO) MODE

This camera/recorder is equipped with a demonstration mode in which the incorporated functions are automatically switched and displayed.

Caution:
The camera/recorder does not accept functions (operations) other than those shown below:

- EJECT
- Setting CAM/OFF/VIDEO switch to OFF

2.1 Setting the Demo Mode

Attach a power supply (battery) and choose one of the following procedures:

1) When "DEMO AUTO" is specified using menu, leave the camera/recorder for approx. 10 minutes with all the following conditions satisfied:
    - Date not set
    - Cassette tape not inserted
    - In the camera recording mode
2) When "DEMO AUTO" is specified using the menu, set the CAM/OFF/VIDEO switch from OFF to CAM while holding down the PLAY button, with all the following conditions satisfied:
    - Cassette tape not inserted
    - STANDBY/LOCK switch set to STANDBY
3) Specify "DEMO START" using the menu with a cassette not inserted, and then release the menu.
   Note: "DEMO START" cannot be specified when a cassette is in the camera/recorder.

2.2 Exiting the Demo Mode

Perform one of the following procedures to exit the demo mode:

1) CAM/OFF/VIDEO switch to OFF or remove the power supply.
2) Load a cassette.

2.3 Contents of Demonstration

The following table shows the examples of display/operation contents in the demo mode:
The display/operation in the demo mode will vary, depending on the model (equipped functions provided or not).

No.	Item	Display content, example of display	Display time	Remarks
1	Start of demo	All display off.	For approx. 4 s	
2	Display of model name		----------	
3	WELCOME display	WELCOME TO HITACHI DIGITAL DEMONSTRATION	----------	
4	Introduction of functions	HQ D.ZOOM/7-MODE EFFECTS/TBC/ CNR/7-COLOR TITLES/EDGE CLEAN/ 6-MODE FADER/2.5" LCD/EIS/ PROGRAM AE	----------	Varies, depending on the model.
5	EIS simulation	EIS OFF: Electronic zoom operation, vertical picture shaking is considerable. EIS ON: Electronic zoom operation, vertical picture shaking is negligible.	For approx. 3 s For approx. 3 s	Only for models with EIS function.
6	HQ DIGITAL ZOOM demonstration	Rapidly changing from wide to tele in digital zoom area. Rapidly changing from tele to wide in digital zoom area.	For approx. 3 s For approx. 3 s	Performed twice.
7	6-MODE FADE demonstration	White Fade: In - Stop - Out Wipe Fade: In - Stop - Out Mosaic Fade: In - Stop - Out Art Fade: In - Stop - Out Zoom Fade: In - Stop - Out Black & White Fade: In - Stop - out	----------	Each stop time is for approx. 1 s.

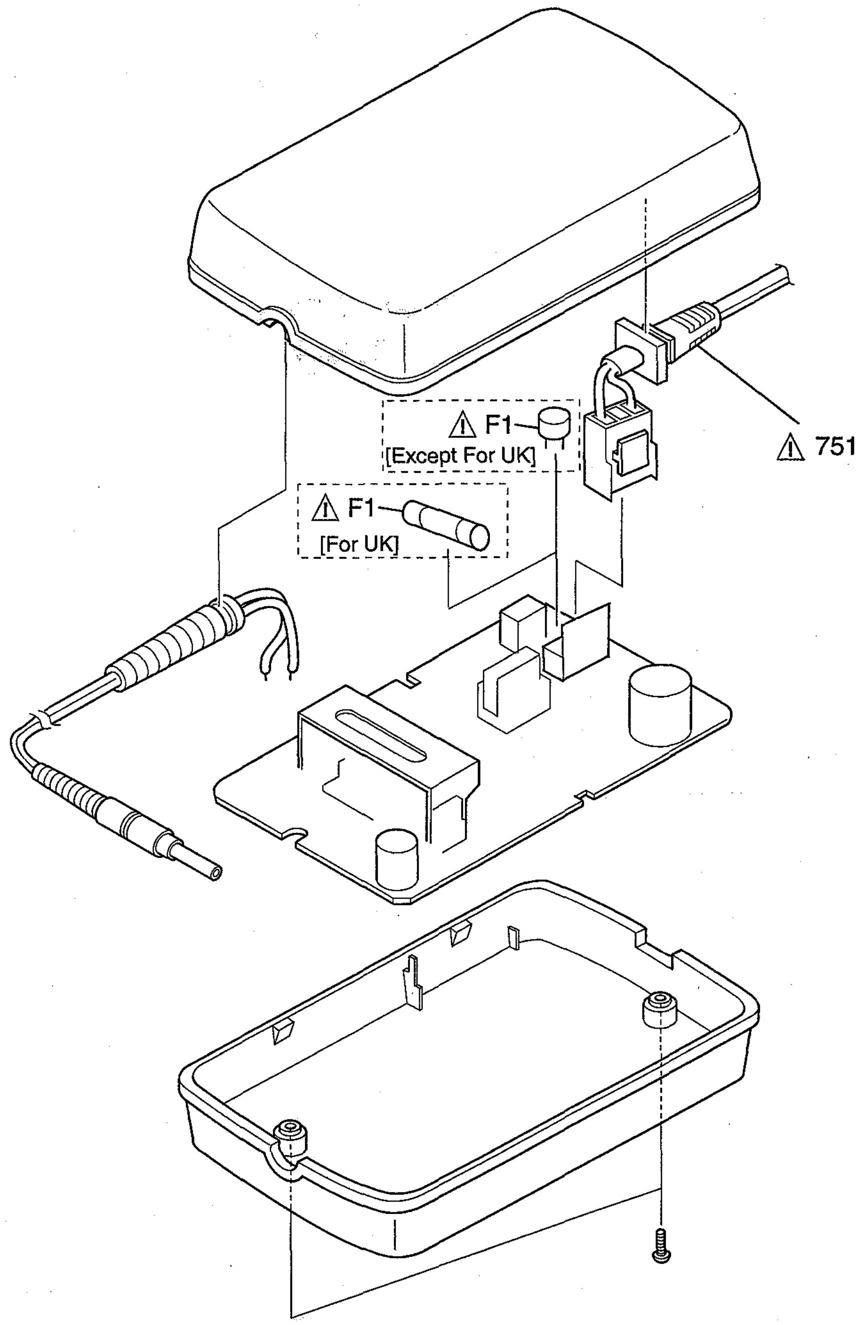
No.	Item	Display content, example of display	Display time	Remarks
8	7-MODE EFFECTS demonstration	16 × 9 picture Negative picture Half -mirror picture Mosaic picture Art picture Sepia color picture No color (black & white) picture	For approx. 3 s each	
9	TBC simulation	TBC OFF: Electronic zoom operation, horizontal picture shaking is negligible. TBC ON: Normal picture (horizontal shaking stops.	For approx. 3 s For approx. 3 s	Performed twice.
10	User registered title demonstration	TITLE DEMO	----------	
11	7-COLOR TITLES demonstration	Preset titles appear in sequence. The display is returned to the first title, and then its color is changed.	For approx. 1 s each For approx. 1 s each	Colors change from white to yellow, cyan, magenta, red, green, and back to white in sequence.
12	Returning to 1.			

Memo

CHAPTER 8 VM-ACE5E(AC ADAPTER)

EXPLODED VIEW & REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
⚠ 751	EV10681	CORD, AC [Except for UK, AU]
⚠ 751	EV10701	CORD, AC [For UK]
⚠ 751	EV10711	CORD, AC [For AU]
⚠ F1	FN10261R	FUSE [Except for UK]
⚠ F1	5722801	FUSE [For UK]


⚠ F1
[Except For UK]
⚠ 751
⚠ F1
[For UK]
E
D
C
B
A
1
2
3
4

HITACHI

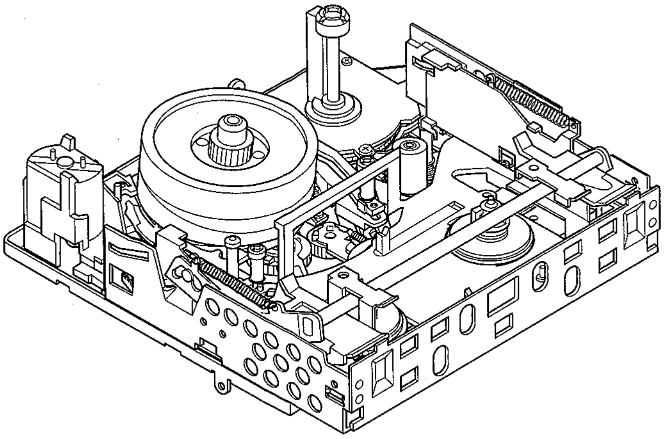
TK | No. 6811E,G

UH MECHANISM

SERVICE MANUAL
Wartungsanleitung

Disassembly & Adjustment

Demontage & Einstellungen



8
Hi8

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT
Änderungen der Technischen Daten und Teile im Sinne ständiger Verbesserung vorbehalten

8mm VIDEO CAMERA/RECORDER
8-mm-Video-Kamerarecorder

January 2000 Digital Media Products Division,Tokai

CONTENTS

List of Component Identifications E1
Jig And Tapes For Adjustment E1

CHAPTER 1 DISASSEMBLY

1. BEFORE STARTING DISASSEMBLY E2
  1.1 Disassembly Procedure E2
  1.2 Main Mechanical Components Identification E3
2. MECHANICAL COMPONENTS REMOVAL E4
  2.1 Cassette Holder E4
  2.2 Cylinder E4
  2.3 Mode Switch, Pulley Gear, Timing Belt E4
  2.4 Idler Cover, Idler, Center Gear, Brake, Brake Gear, Take-up Reel Disk, Pressure Arm, OHD Arm, Tension Band, B-Base, Tension arm, Supply Reel Disk E5
  2.5 Mecha. Sensor Circuit Board E6
  2.6 Sub Chassis, ED Arm E6
  2.7 Cylinder Base, Brush E7
  2.8 Guide Rail (I), Guide Roller (I), Guide Rail (O), Guide Roller (O) E7
  2.9 Loading Motor Holder (with Loading Motor), Capstan Motor E7
  2.10 Link (R), Link (L), Drive Lever, Cam Gear (C), Pressure Plate, Drive Arm, Operation Plate, Cam Gear (B), Cam Gear (A) E8
  2.11 Gear Phase Matching Diagrams E9
3. METHOD FOR MANUAL UNLOADING E10
4. PHOTO OF THE MECHANISM E11

CHAPTER 2 MECHANICAL ADJUSTMENT

1. ADJUSTMENT POINTS ON THE MECHANISM E12
2. BEFORE STARTING ADJUSTMENT E12
3. TAPE TRANSPORT SYSTEM CHECK/ADJUSTMENT E12
  3.1 Tension Arm Position Adjustment E13
  3.2 Tension Torque Check/Adjustment E13
  3.3 Cylinder Base (Guide Roller Catchers) Height Adjustment E14
  3.4 Guide Rollers Height Rough Adjustment E14
  3.5 Guide Rollers Height Adjustment E15
  3.6 OHD Arm Height Adjustment E16
4. CHECK THE TORQUE E17

CHAPTER 3 MAINTENANCE/INSPECTION PROCEDURE

1. REQUIRED MAINTENANCE E17
2. SCHEDULED MAINTENANCE E17
3. CHECK BEFORE STARTING REPAIRS E17
4. TOOLS NEED FOR INSPECTION AND MAINTENANCE E18
5. MAINTENANCE PROCEDURE E18
  5.1 Cleaning E18
  5.2 Lubrication E18
  5.3 Greasing E19

CHAPTER 4 EXPLODED VIEW

MECHANISM 20

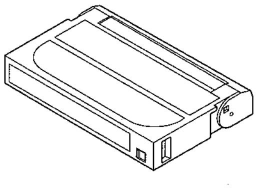
List of Component Identifications

Since the component names in this manual comply with those in the replacement parts list, many abbreviations and short names are used. The following table lists abbreviations for formal (general) names.

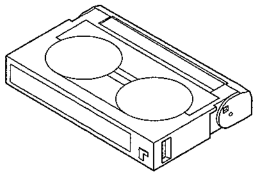
Abbreviations	Formal (general) names	Abbreviations	Formal (general) names
B-Base	Tension Band Base	Guide Roller (I)	Supply Guide Roller
Brake	Supply Sub Brake	Guide Roller (O)	Take-up Guide Roller
Brake Gear	Take-up Brake Gear	Link (L)	Supply Link Gear
Brush	Cylinder Brush	Link (R)	Take-up Link Gear
CM Base	Capstan Motor Base	LM Gear	Loading Motor Gear
Drive Arm	Loading Drive Arm	Mode Switch	Mechanism State Switch
Drive Lever	Pressure Roller Drive Lever	OHD Arm	Pull Out Arm
ED Arm	Eject Drive Arm	Pressure Arm	Pressure Roller Arm
Guide Rail (I)	Supply Guide Roller Rail	Operation Plate	Tension Operation Plate
Guide Rail (O)	Take-up Guide Roller Rail		

Jigs And Tapes For Adjutstment

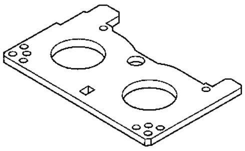
1. **ALIGNMENT TAPE**
   Color Bar/400Hz
   For NTSC
   20HSC-2: No. 7099231
   For PAL
   20HSC-3: No. 7099232



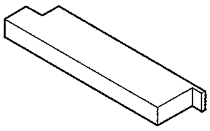
2. **CASSETTE TORQUE METER**
   For NTSC
   SRK-8T-132: No. 7099235
   SRK-8T-112: No. 7099385
   For PAL
   SRK-8T-232: No. 7099236
   SRK-8T-212: No. 7099402



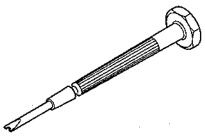
3. **MASTER PLANE**
   No. 7099237



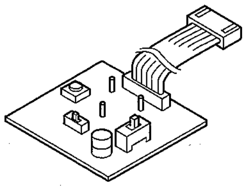
4. **REEL DISK HEIGHT JIG**
   No. 7099238



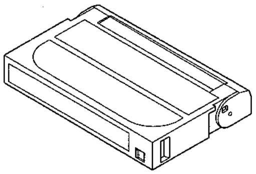
5. **SPECIAL DRIVER**
   No. 7099239



6. **ATF-R JIG** (*1, *2)
   No. 7069461



7. **BLANK TAPE**
   For NTSC: P6-120
   For PAL: P5-90



[Goods on the Market]

*1. Always set SW3 on the ATF-R jig to ON.
*2. The ATF jig (No.7099386) can also be used in place of ATF-R jig to adjust this model.

CHAPTER 1 DISASSEMBLY

1. BEFORE STARTING DISASSEMBLY

(1) The UH mechanism must basically be dismantled in the unloading stop state.
To manually set the mechanism to the unloading stop state, refer to "3. Method for Manual Unloading".

(2) Dismantle each component according to "1.1 Disassembly procedure".

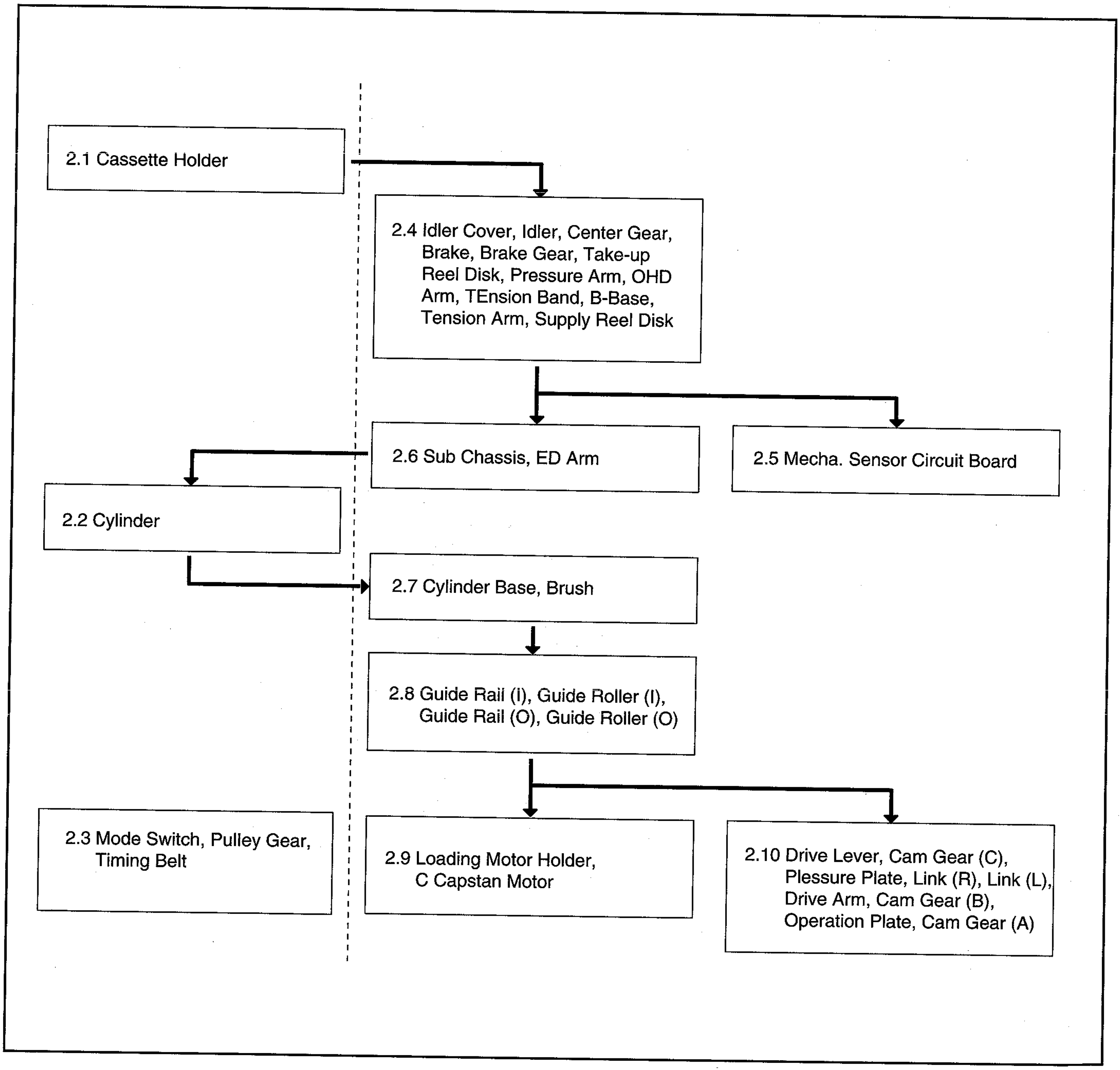
(3) For reassembly, perform the reverse procedure to disassembly when not otherwise specified.

(4) Do not reuse removed washers.

(5) Since the component names in this manual comply with those in the replacement parts list, many abbreviations and short names are used. For formal (general) names, refer to the table on the first page of this manual.

1.1 Disassembly Procedure

Note: Components on the left in broken lines can be removed independently.


2.1 Cassette Holder
2.4 Idler Cover, Idler, Center Gear, Brake, Brake Gear, Take-up Reel Disk, Pressure Arm, OHD Arm, TEnsion Band, B-Base, Tension Arm, Supply Reel Disk
2.6 Sub Chassis, ED Arm
2.5 Mecha. Sensor Circuit Board
2.2 Cylinder
2.7 Cylinder Base, Brush
2.8 Guide Rail (I), Guide Roller (I), Guide Rail (O), Guide Roller (O)
2.3 Mode Switch, Pulley Gear, Timing Belt
2.9 Loading Motor Holder, C Capstan Motor
2.10 Drive Lever, Cam Gear (C), Plessure Plate, Link (R), Link (L), Drive Arm, Cam Gear (B), Operation Plate, Cam Gear (A)

1.2 Main Mechanical Conponents Identification

1.2.1 TopView

1. Cylinder
2. Capstan Motor
3. Guide Rail (O) [Take-up Guide Roller Rail]
4. Guide Roller (O) [Take-up Guide Roller]
5. OHD Arm [Pull Out Arm]
6. Pressure Arm [Pressure Roller Arm]
7. Take-up Reel Disk
8. Mecha. Sensor Circuit Board
9. Idler Cover
10. Idler
11. Sub Chassis
12. Supply Reel Disk
13. Link (R) [Take-up Link Gear]
14. Link (L) [Supply Link Gear]
15. Tension Band
16. Guide Roller (I) [Supply Guide Roller]
17. Tension Arm
18. Guide Rail (I) [Supply Guide Roller Rail]
19. Main Chassis
20. Loading Motor Holder
21. Cylinder Base

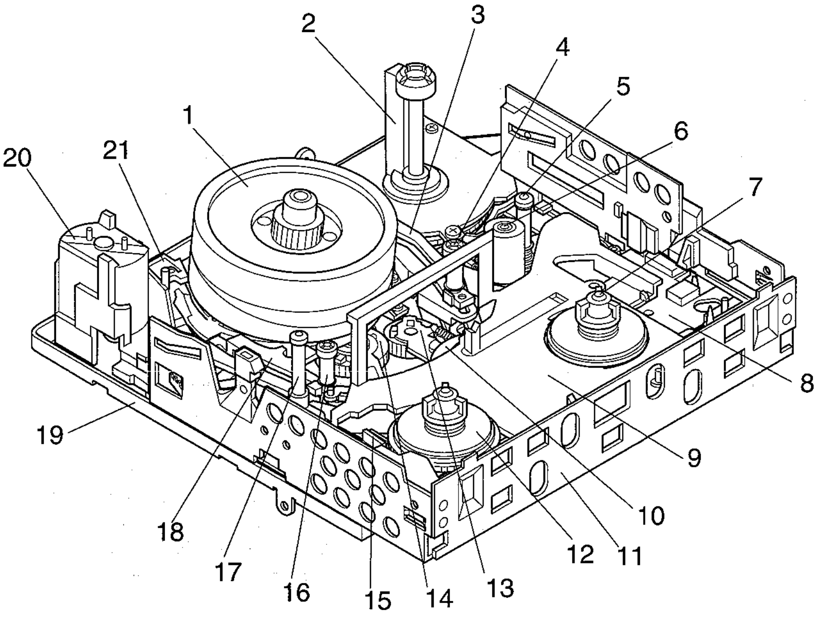


Fig. 1-1

1.2.2 Bottom View

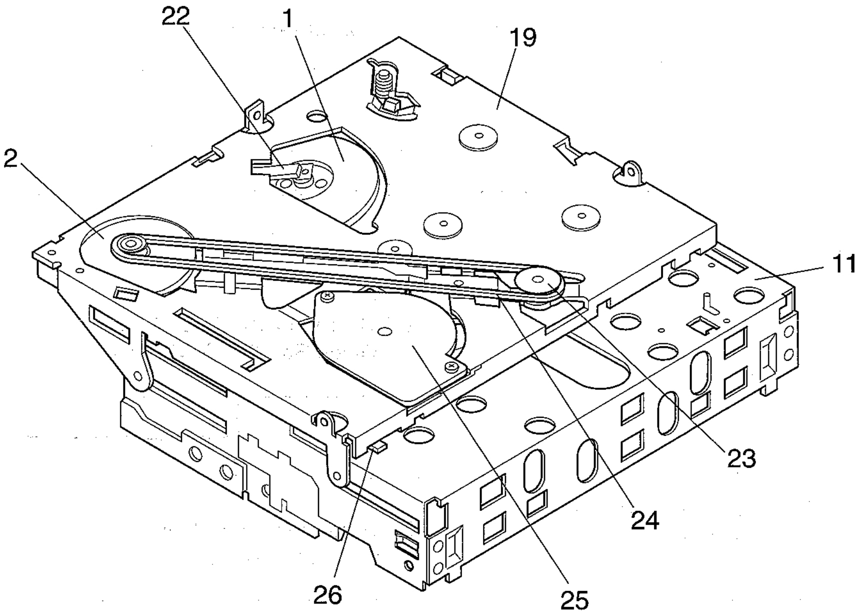


Fig. 1-2

1. Cylinder
2. Capstan Motor
11. Sub Chassis
19. Main Chassis
22. Brush [Cylinder Brush]
23. Pulley Gear
24. Timing Belt
25. Mode Switch [Mechanism State Switch]
26. ED Arm [Eject Drive Arm]

2. MECHANICAL COMPONENTS REMOVAL

2.1 Cassette Holder

Note: If the cassette holder does not raise, to move the EJECT LOCK of the holder to raise it. (See Fig. 2-1)

(1) Remove the E-rings holding the cassette holder on the left and right. (See Fig. 2-1)
(2) Use the linked sections of the holder front arms (L&R) with the sub chassis as pivots, to lift the rear arms (L&R) in the direction of the arrow.
(3) Release the front arms (L&R) from the sub chassis, and remove the cassette holder.

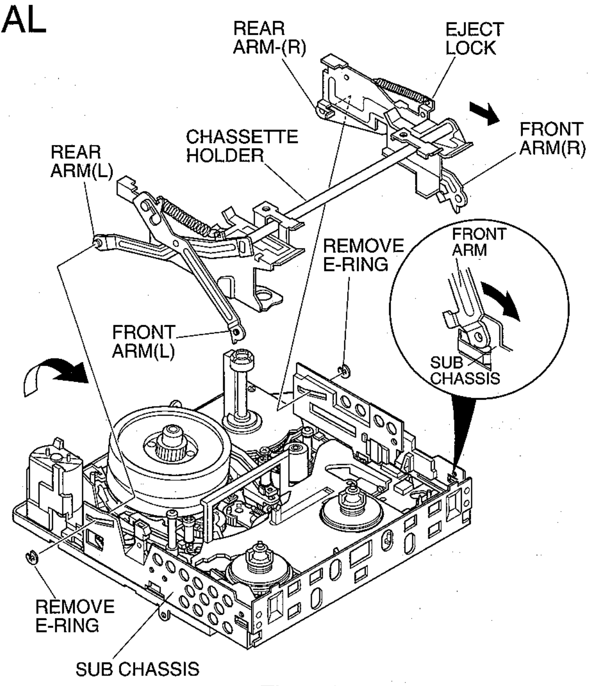

REAR ARM-(R)
EJECT LOCK
FRONT ARM(R)
CHASSETTE HOLDER
REAR ARM(L)
REMOVE E-RING
FRONT ARM
SUB CHASSIS
FRONT ARM(L)
REMOVE E-RING
SUB CHASSIS

Fig.2-1

2.2 Cylinder

Note: Be sure not to touch video head tips with your fingers or tools, etc. during work.

(1) Remove 3 screws. (See Fig. 2-2)

Reinstallation procedure and caution:

1. After reinstalling the cylinder, be sure to perform the following mechanical adjustment.
   GUIDE ROLLERS HEIGHT ADJUSTMENT
   (ADJUSTMENT AFTER REPLACING THE CYLINDER)

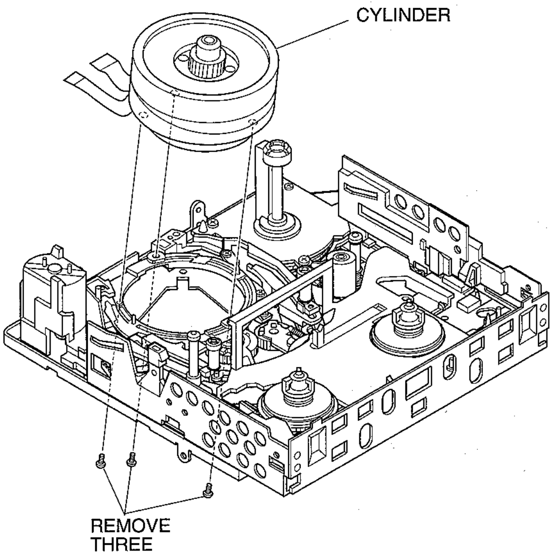

CYLINDER
REMOVE THREE SCREWS

Fig.2-2

2.3 Mode Switch, Pulley Gear, Timing Belt

Note: Remove these components before removing the idler gear on the next item.

■ Mode Switch

(1) Remove 1 screw. (See Fig. 2-3)

Reinstallation procedure and caution:

1. Make sure of gear phase. (See Figs. 2-3(B), 2-14 and 2-15)

■ Pulley Gear, Timing Belt

(1) Remove 1 washer. (See Fig. 2-3 (A))
(2) Pull up the pulley gear and remove the timing belt.

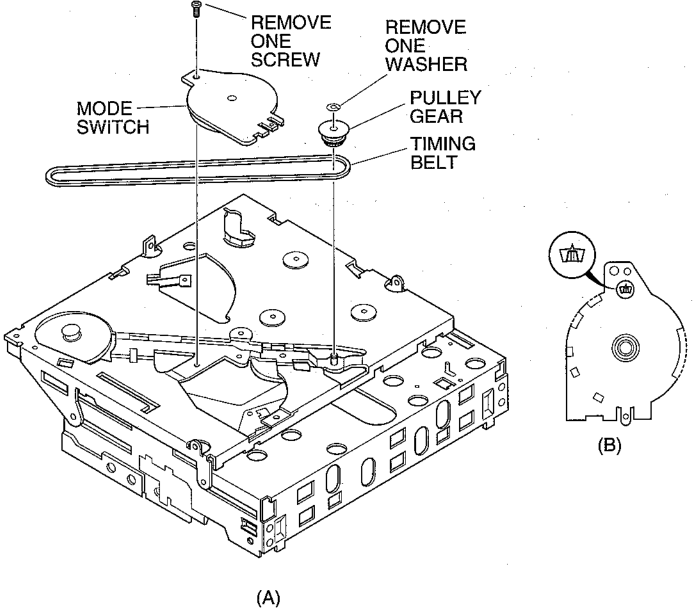

REMOVE ONE SCREW
REMOVE ONE WASHER
MODE SWITCH
PULLEY GEAR
TIMING BELT
(A)
(B)

Fig.2-3

2.4 Idler Cover, Idler, Center Gear, Brake, Brake Gear, Take-up Reel Disk, Pressure Arm, OHD Arm, Tension Band, B-Base, Tension arm, Supply Reel Disk

Notes: 1. Do not turn over the sub chassis with the idler cover removed.

2. To separate the sub chassis from the main chassis, remove only components marked @ and proceed with removal of "2.6 Sub Chassis and ED Arm".

■ **Idler Cover** (@)

(1) Release the spring (a) between the brake and sub chassis. (See Fig. 2-4)
(2) Release the spring (b) between the pressure arm and idler cover.
(3) Release the spring (c) between the B-base and idler cover.
(4) Remove 4 screws.

■ **Idler** (@), **Center Gear**

(5) Remove the idler. (See Fig. 2-4)
(6) Pull up the center gear.

■ **Brake** (@)

(5) Remove the brake. (See Fig. 2-4)

■ **Brake Gear**

(5) Pull up the brake gear. (See Fig. 2-4)

■ **Take-up Reel Disk**

(5) Pull up the take-up reel disk. (See Fig. 2-4)

■ **Pressure Arm, OHD Arm**

(5) Pull up the pressure arm. (See Fig. 2-4)
(6) Release the spring (d) between the sub chassis and OHD arm.
(7) Pull out the OHD arm.

Reinstallation procedure and caution:

1. The pressure arm and OHD arm must be installed in the positions shown in Fig. 2-6(B).
2. After reinstalling the OHD arm, be sure to perform the following mechanical adjustment.
   OHD ARM HEIGHT ADJUSTMENT

■ **Tension Band, B-Base, Tension Arm**

(5) Release the tension spring. (See Fig. 2-4)
(6) Remove 1 screw holding the tension band and B-base.
(7) Remove the tension band with the tension arm.
(8) Remove the tension band from the tension arm in the direction of the arrow. (See Fig. 2-5)

Reinstallation procedure and caution:

1. The tension arm and must be installed in the positions shown in Fig. 2-6(A).
2. After reinstalling the tension band and tension spring, be sure to perform the following mechanical adjustment.
   TENSION ARM POSITION ADJUSTMENT
   TENSION TORQUE CHECK/ADJUSTMENT

■ **Supply Reel Disk**

(9) Pull up the supply reel disk. (See Fig. 2-4)

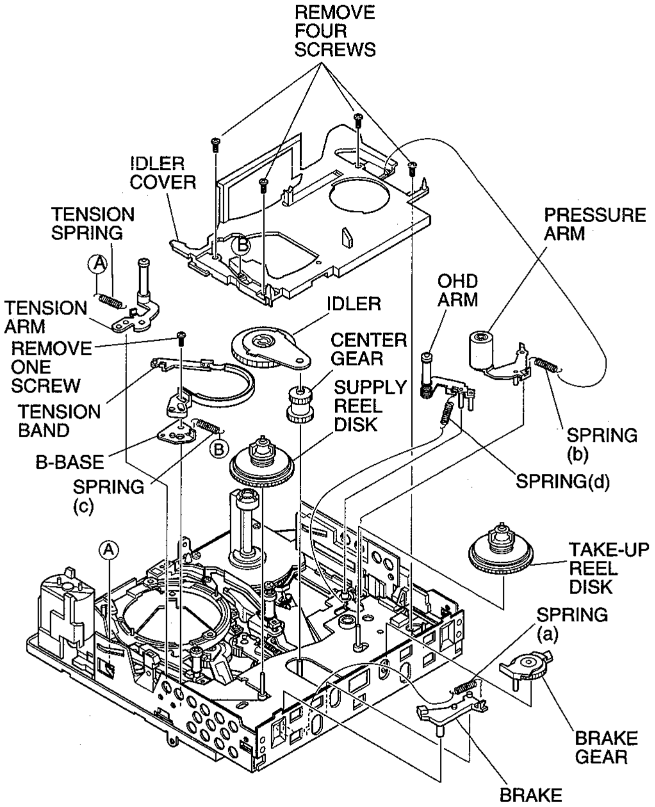

REMOVE FOUR SCREWS
IDLER COVER
TENSION SPRING
PRESSURE ARM
A
B
OHD ARM
TENSION ARM
IDLER
REMOVE ONE SCREW
CENTER GEAR
SUPPLY REEL DISK
TENSION BAND
B-BASE
B
SPRING (b)
SPRING(d)
SPRING (c)
A
TAKE-UP REEL DISK
SPRING (a)
BRAKE GEAR
BRAKE

Fig.2-4

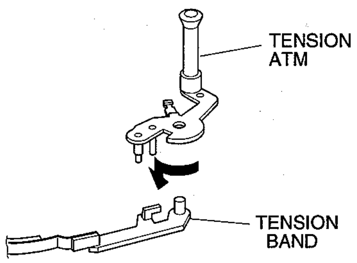

TENSION ATM
TENSION BAND

Fig.2-5

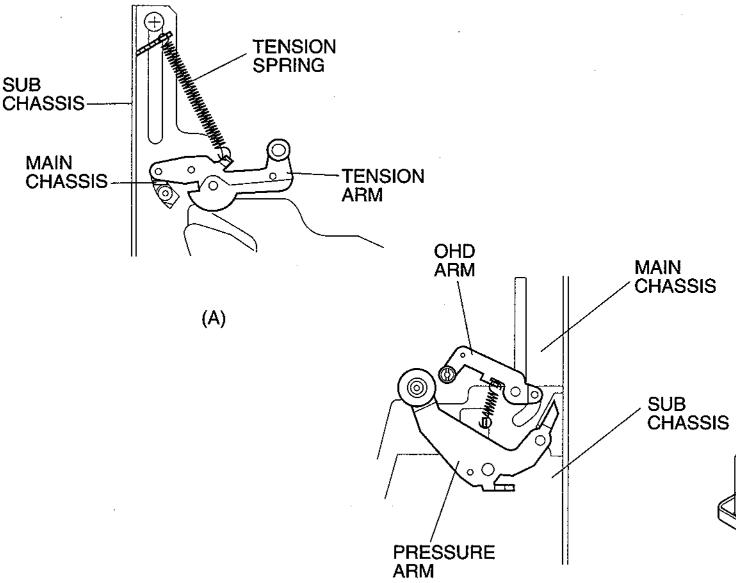

TENSION SPRING
SUB CHASSIS
MAIN CHASSIS
TENSION ARM
(A)
OHD ARM
MAIN CHASSIS
SUB CHASSIS
PRESSURE ARM
(B)

Fig.2-6

2.5 Mecha. Sensor Circuit Board

(1) Disconnect flat cable (See Fig. 2-7).
(2) Remove 4 screws.
(3) Remove 1 screws.

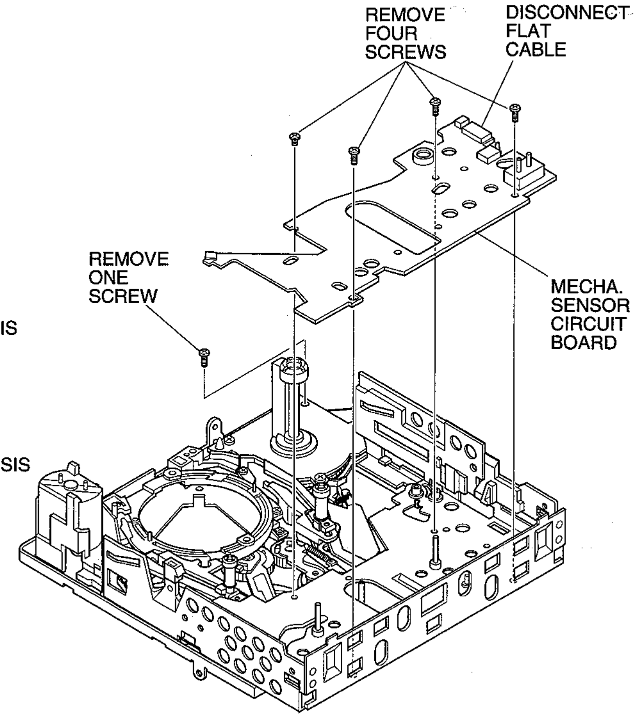

REMOVE FOUR SCREWS
DISCONNECT FLAT CABLE
REMOVE ONE SCREW
MECHA. SENSOR CIRCUIT BOARD

Fig.2-7

2.6 Sub Chassis, ED Arm

(1) Remove 2 screws. (See Fig. 2-8)
(2) Release linked sections (A) and (B) with the main chassis.
(3) Remove the ED Arm.

Reinstallation procedure and caution:

1. The ED arm must be installed in the position shown in Fig. 2-9(A).
2. Install the sub chassis so that sections (A) and (B) are linked with the main chassis. (See Fig. 2-8)
3. Install the sub chassis so that the projection of cam gear (B) and the screw are set to the positions shown in Fig. 2-9(B).

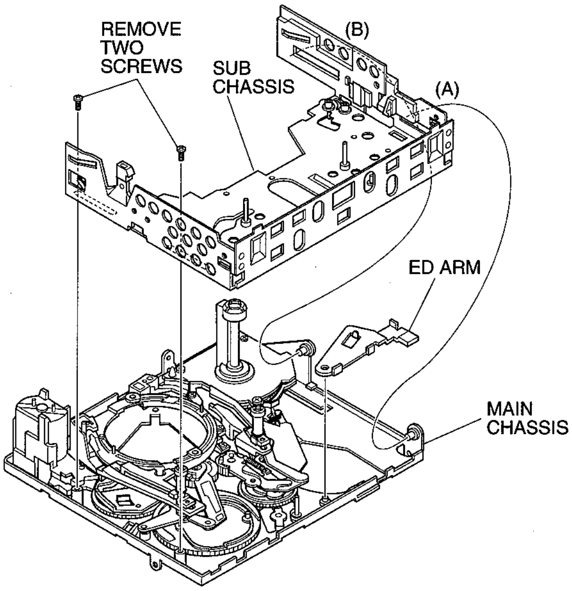

REMOVE TWO SCREWS
(B)
SUB CHASSIS
(A)
ED ARM
MAIN CHASSIS

Fig.2-8

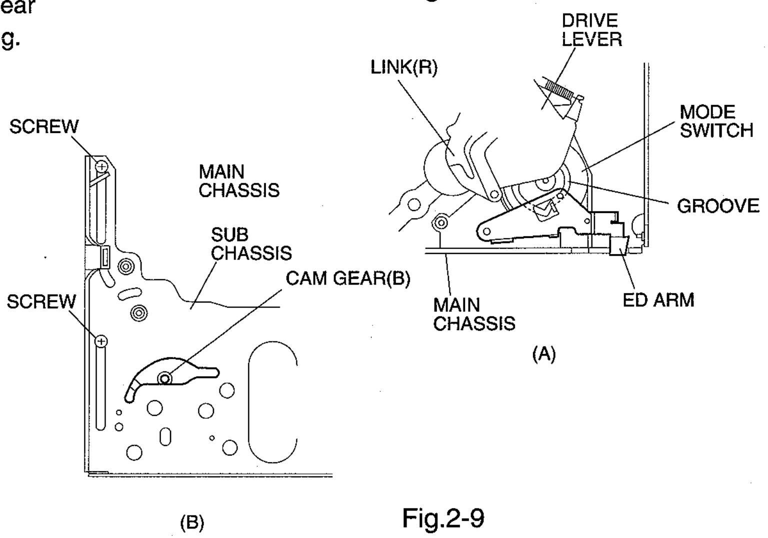

DRIVE LEVER
LINK(R)
MODE SWITCH
GROOVE
MAIN CHASSIS
ED ARM
(A)
SCREW
MAIN CHASSIS
SUB CHASSIS
CAM GEAR(B)
SCREW
(B)

Fig.2-9

2.7 Cylinder Base, Brush

(1) Remove 3 screws. (See Fig. 2-10)
(2) Remove 1 screw.

Reinstallation procedure and caution:

1. After reinstalling the cylinder base, be sure to perform the following mechanical adjustment.
   CYLINDER BASE HEIGHT ADJUSTMENT
   GUIDE ROLLERS HEIGHT ADJUSTMENT

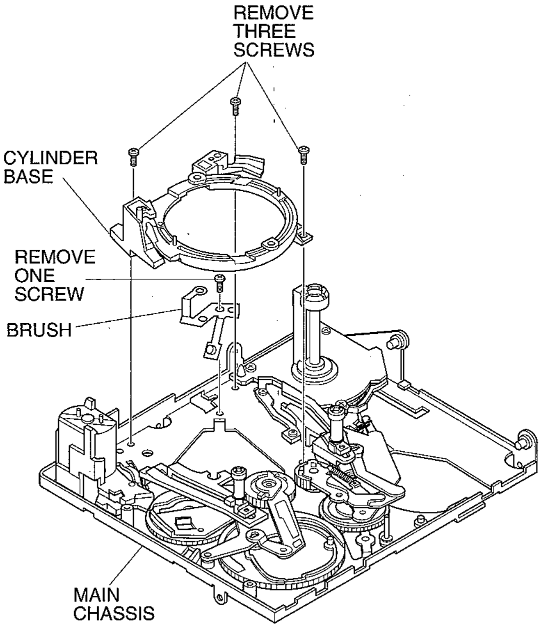

REMOVE THREE SCREWS
CYLINDER BASE
REMOVE ONE SCREW
BRUSH
MAIN CHASSIS

Fig.2-10

2.8 Guide Rail (I), Guide Roller (I), Guide Rail (O), Guide Roller (O)

Reinstallation procedure and caution:

1. After reinstalling the guide roller (I) or (o), be sure to perform the following mechanical adjustment.
   GUIDE ROLLERS HIGHT ROUGH ADJUSTMENT
   GUIDE ROLLERS HIGHT ADJUSTMENT

■ Guide Rail (I), Guide Roller (I)

(1) Remove 1 screw. (See Fig. 2-11)
(2) Turn guide rail (I) with guide roller (I) in the direction of the arrow (in parallel with the main chassis), to release guide roller (I) from link (L).
(3) Move guide roller (I) in the loading direction to remove it from guide rail (I).

■ Guide Rail (O), Guide Roller (O)

(1) Remove 2 screws. (See Fig. 2-11)
(2) Turn guide rail (O) with guide roller (O) in the direction of the arrow (in parallel with the main chassis), to release guide roller (O) from link (R).
(3) Move guide roller (O) in the loading direction to remove it from guide rail (O).

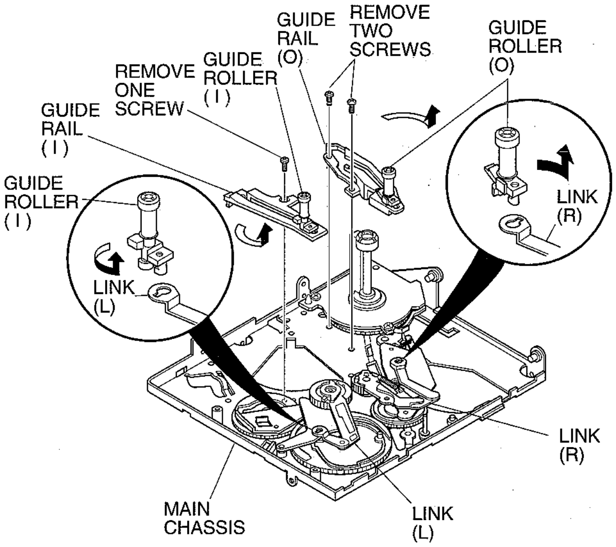

GUIDE RAIL (O)
REMOVE TWO SCREWS
GUIDE ROLLER (O)
REMOVE ONE SCREW
GUIDE ROLLER (I)
GUIDE RAIL (I)
GUIDE ROLLER (I)
LINK (L)
LINK (R)
LINK (R)
MAIN CHASSIS
LINK (L)

Fig.2-11

2.9 Loading Motor Holder (with Loading Motor), Capstan Motor

■ Loading Motor Holder

(1) Release 3 tabs. (See Fig. 2-12)

Reinstallation procedure and caution:

1. Make sure of gear phase. (See Figs. 2-14 and 2-15)
2. If guide rail (I) has been removed, install the loading motor holder before installing guide rail (I).

■ Capstan Motor

(1) Remove 2 screws. (See Fig. 2-12)
(2) Remove the timing belt

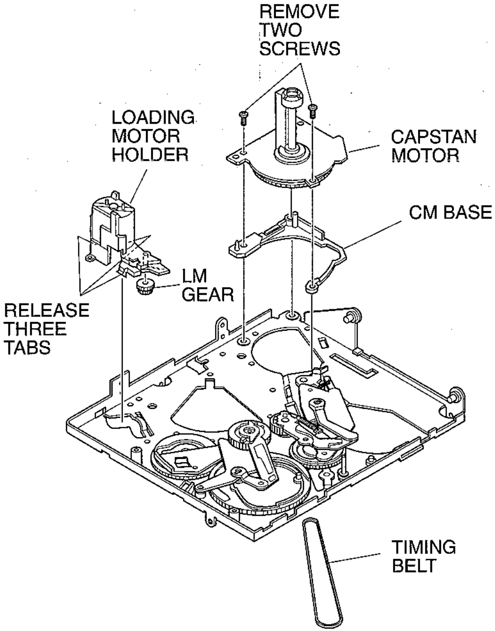

REMOVE TWO SCREWS
LOADING MOTOR HOLDER
CAPSTAN MOTOR
CM BASE
LM GEAR
RELEASE THREE TABS
TIMING BELT

Fig.2-12

2.10 Link (R), Link (L), Drive Lever, Cam Gear (C), Pressure Plate, Drive Arm, Operation Plate, Cam Gear(B), Cam Gear (A)

Reinstallation procedure and caution:

1. When installing either of the following components, install the mode switch and make sure of phase matching of gears. (See Figs. 2-14 and 2-15)
2. If the loading motor holder has been removed, install it after making sure of phase matching of gears as shown above.

■ Link (R), Link (L)

(1) Remove 1 washer (a) and remove the link (R). (See Fig. 2-13)
(2) Remove 1 washer (b) and remove the link (L).

■ Drive Lever, Cam Gear (C), Pressure Plate

Note: The spring between the drive lever and pressure plate is strong. Remove and reinstall it by the following procedure:

(3) Remove 1 washer (c). (See Fig. 2-13)
(4) Removing the drive lever from the main chassis, release the spring between the drive lever and pressure plate.
(5) Remove 1 washer (d) and remove the pressure plate.
(6) Remove 1 washer (e) and remove the cam gear (C).

Procedure for reinstalling drive lever and caution:

1. The loading motor and mode switch must be installed and gear phases matched.
2. Before installing the drive lever in the regular position (as shown in Fig. 2-15), hook the spring between the drive lever and pressure plate.
3. Fixing the pressure plate near the regular position (as shown in Fig. 2-15) with tweezers, etc., install the drive lever in the regular position.

■ Drive Arm, Operation Plate, Cam Gear (B), Cam Gear (A)

(3) Remove 1 washer (f) and remove the drive arm. (See Fig. 2-13)
(4) Remove the operation plate.
(5) Remove 1 washer (g) and remove the cam gear (B).
(6) Remove 1 washer (h) and remove the cam gear (A).

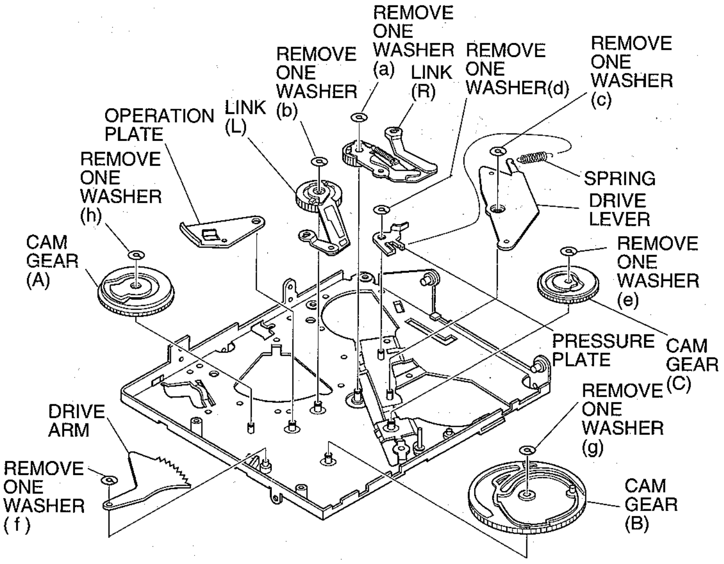

REMOVE ONE WASHER (a)
REMOVE ONE WASHER (b)
LINK (R)
REMOVE ONE WASHER(d)
REMOVE ONE WASHER (c)
OPERATION PLATE
LINK (L)
REMOVE ONE WASHER (h)
SPRING
DRIVE LEVER
CAM GEAR (A)
REMOVE ONE WASHER (e)
PRESSURE PLATE
CAM GEAR (C)
REMOVE ONE WASHER (g)
DRIVE ARM
REMOVE ONE WASHER (f)
CAM GEAR (B)

Fig.2-13

2.11 Gear Phase Matching Diagrams

The following diagrams show the phase matching of gears in the unloading stop state.

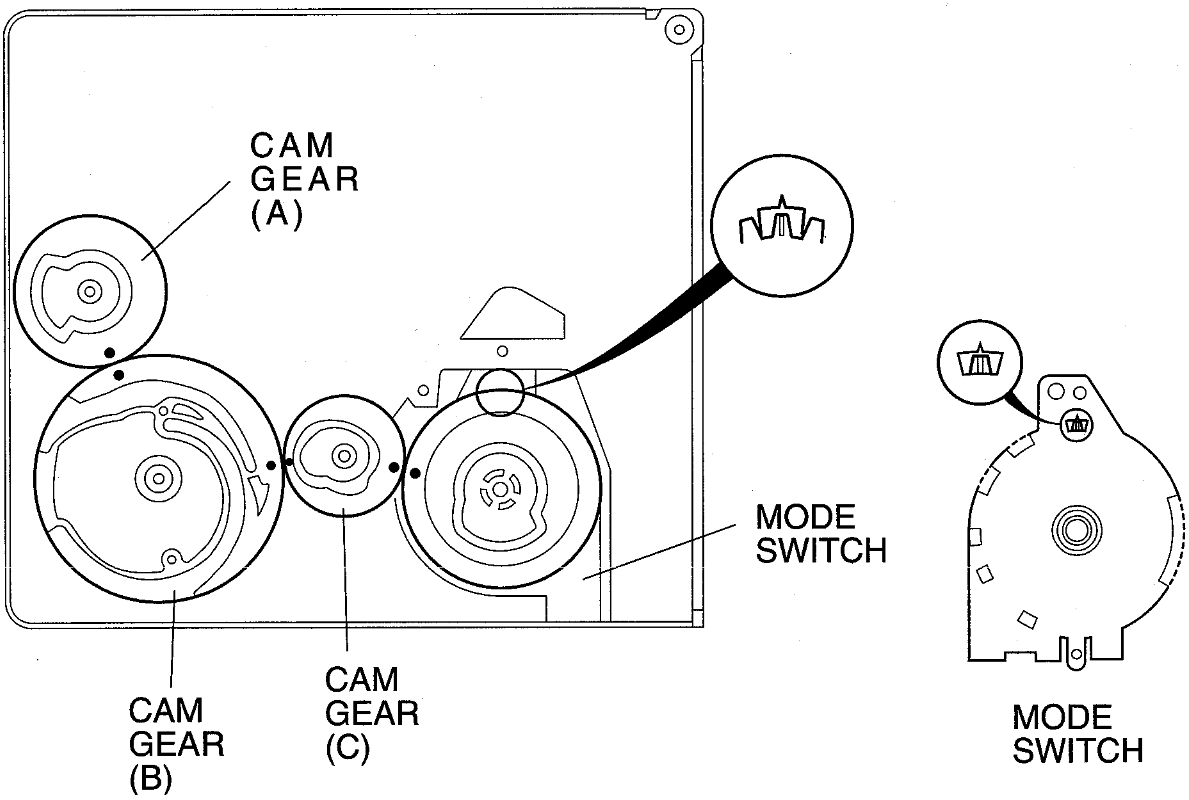

CAM GEAR (A)
MODE SWITCH
CAM GEAR (B)
CAM GEAR (C)
MODE SWITCH

Fig.2-14

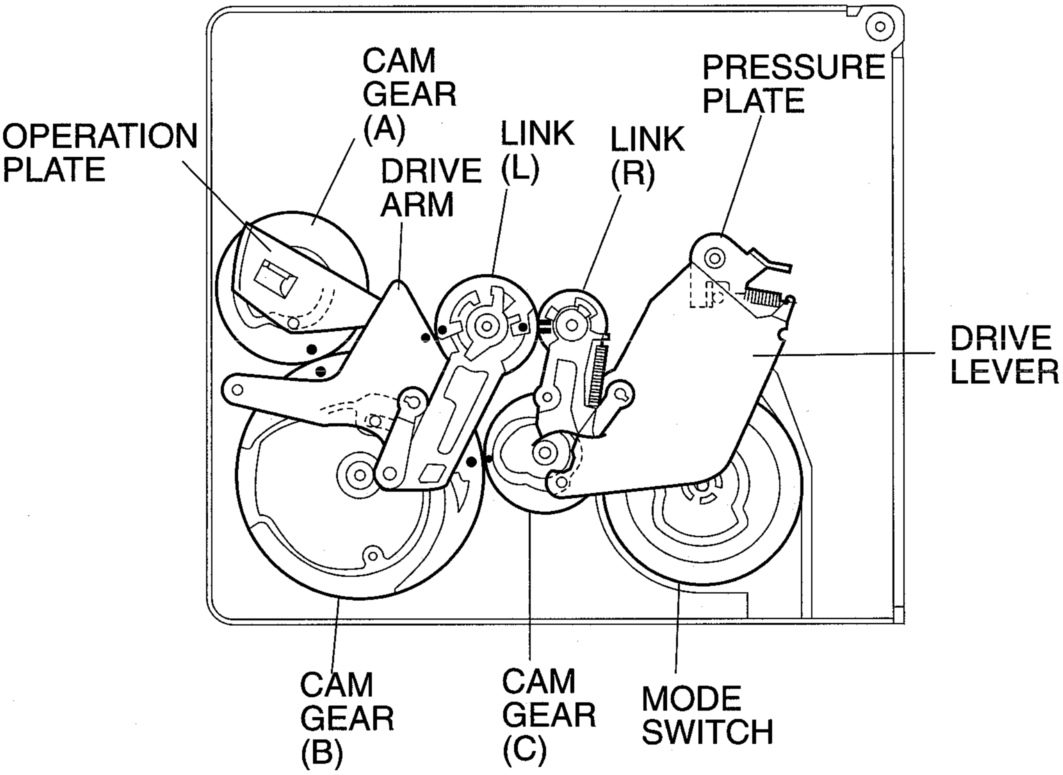

CAM GEAR (A)
PRESSURE PLATE
OPERATION PLATE
LINK (L)
LINK (R)
DRIVE ARM
DRIVE LEVER
CAM GEAR (B)
CAM GEAR (C)
MODE SWITCH

Fig.2-15

3. METHOD FOR MANUAL UNLOADING

CAUTION :

Perform this procedure for emergency only when normal unloading is not possible because the electrical circuits or loading motor is defective.

1) Release 2 tabs and pull out the loading motor from the loading motor holder. (See Fig. 3-1)

Note: The above removal is different from normal removal. In normal circumstances, remove the loading motor assembled with the loading motor holder. (The loading motor and loading motor holder comprise an assembly.)

2) Turn over the mechanism.

Note: Do not turn over with the idler cover removed.

3) Use a flat-bladed screwdriver, etc. to turn cam gear (A) or cam gear (B) in the directions of the arrows.

Notes: 1. Be careful not to damage the cam gears.
2. If tape is loaded, also turn the capstan motor manually to take up the tape.

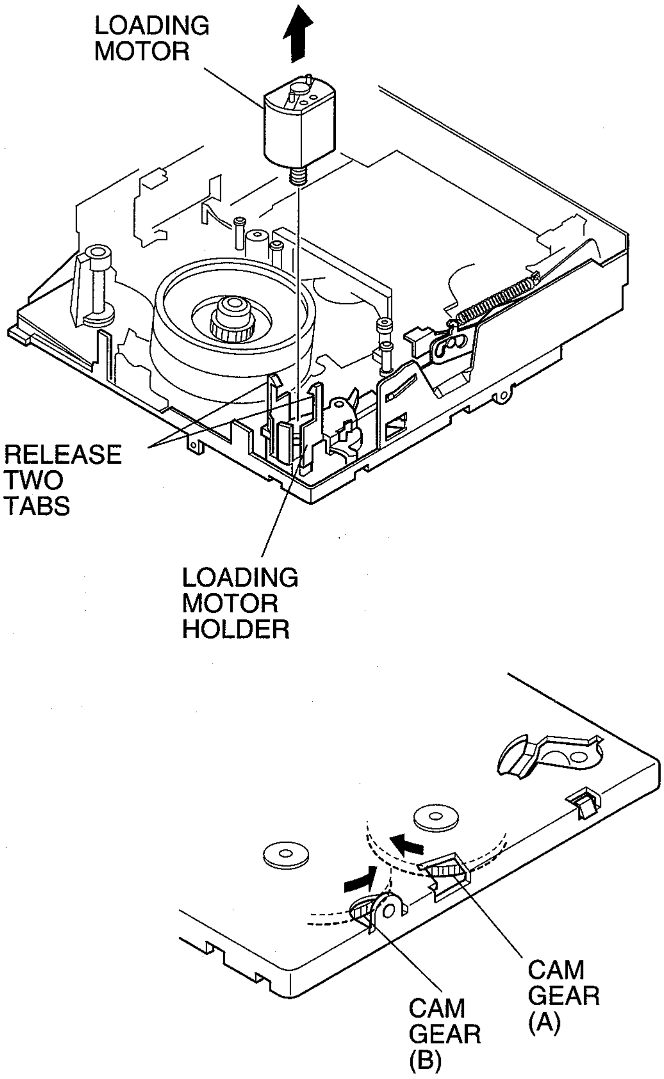
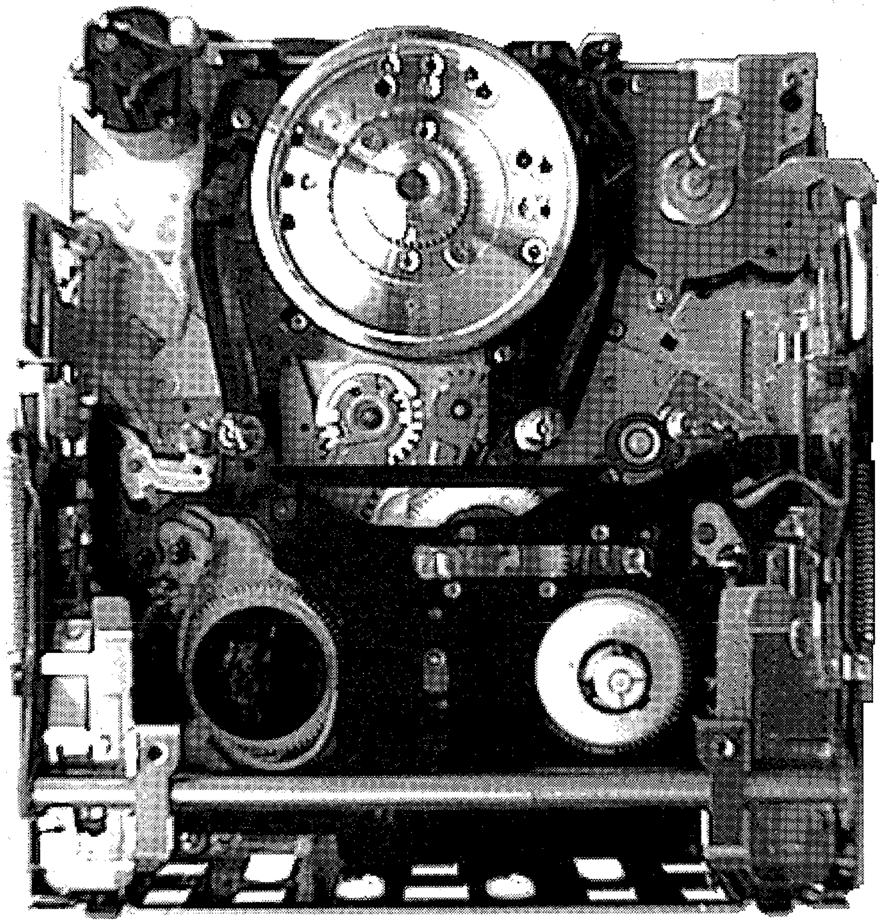


Fig.3-1

4. PHOTO OF THE MECHANISM



CHAPTER 2 MECHANICAL ADJUSTMENT

1. ADJUSTMENT POINTS ON THE MECHANISM

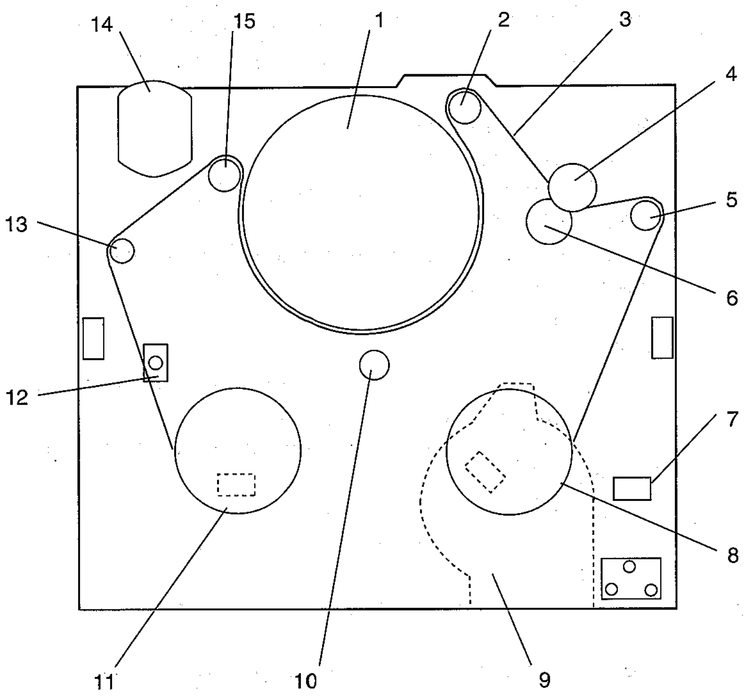


Fig. 1-1

1. Cylinder
2. Guide Roller (O) [Take-up Guide Roller]
3. Tape
4. Capstan Motor
5. OHD Arm [Pull Out Arm]
6. Pressure Arm [Pressure Roller]
7. Cassette Holder Switch
8. Take-up Reel Disk
9. Mode Switch [Mechanism State Switch]
10. End LED
11. Supply Reel Disk
12. Tension Band Holder
13. Tension Arm [Tension Pole]
14. Loading Motor
15. Guide Roller (I) [Supply Reel Disk]

2. BEFORE STARTING ADJUSTMENT

(1) See "CHAPTER 1 DISASSEMBLY" for dismantling and reassembling the mechanism, and matching phases of gears in assembly.

(2) The following describes the procedure for setting the mechanism to the playback mode without inserting a cassette (a circuit board that mounts mechanism drive circuits must be connected):
The playback mode cannot be kept by any of the following procedures because reel disks do not turn, etc.:
  1) Set the mechanism to the unloading stop or eject mode.
  2) Shade light from the end LEDs.
  3) Lower the cassette holder.
  4) Press the playback button.

(3) The following shows the procedure for loading and unloading the unassembled mechanism:
  1) Supply 4V DC to the terminals of loading motor:
  Red lead wire (+), brown lead wire (-): Loading
  Brown lead wire (+), red lead wire (-): Unloading

3. TAPE TRANSPORT SYSTEM CHECK/ADJUSTMENT

The tape transport system is a generic term for the path from the supply reel disk to the take-up reel disk via cylinder.

Notes: 1. The tape transport system is adjusted before shipment from the factory, so perform adjustments only when components of the transport system are replaced or adjustments of the transport system have drafted.
2. The tape transport components, especially the components which come into direct contact with the tape, should be kept clean without damage, dust or oil, etc. adhering to the contact surfaces.

3.1 Tension Arm Position Adjustment (Fig. 3-1)

Note: Be sure to perform these adjustment after reinstalling the tension arm, tension band, tension spring.

■ Adjustment Point
Tension Band Holder

■ Procedure

(1) Hook the tension spring to position (b) of the hook on the sub chassis. (See Fig. 3-1)
(2) Set to the playback mode without loading a cassette. (See Fig. 3-1)
(3) Loosen screw (A), and adjust the position of tension band holder so that the relation of position between the tension arm and square hole in the loading motor holder is as shown in Fig. 3-1.
(4) After unloading, perform loading and make sure that the square hole position has not drifted.

Note: After the adjustment is completed, be sure to perform "3.2 Tension Torque Check/Adjustment".

3.2 Tension Torque Check/Adjustment (Fig. 3-1)

Note: Be sure to perform these check/adjustment after adjusting the tension arm position adjustment.

■ Test Equipment/Jig
Cassette Torque Meter
(NTSC: SRK-8T-112, PAL: SRK-8T-212)

■ State of VCR
Load a cassette torque meter and set the playback mode.

■ Adjustment Point
Tension Spring

■ Procedure

(1) Hook the tension spring to position (b) of the hook on the sub chassis. (See Fig. 3-1)
(2) Check the torque meter on the supply side to 7 to 11 g-cm.
If it is more than 11.1 g-cm:
Move the tension spring to position (c).
If it is less than 6.9 g-cm:
Move the tension spring to position (a).

Note: If the tension spring hooking position has been moved, be sure to perform "3.1 Tension Arm Position Adjustment".

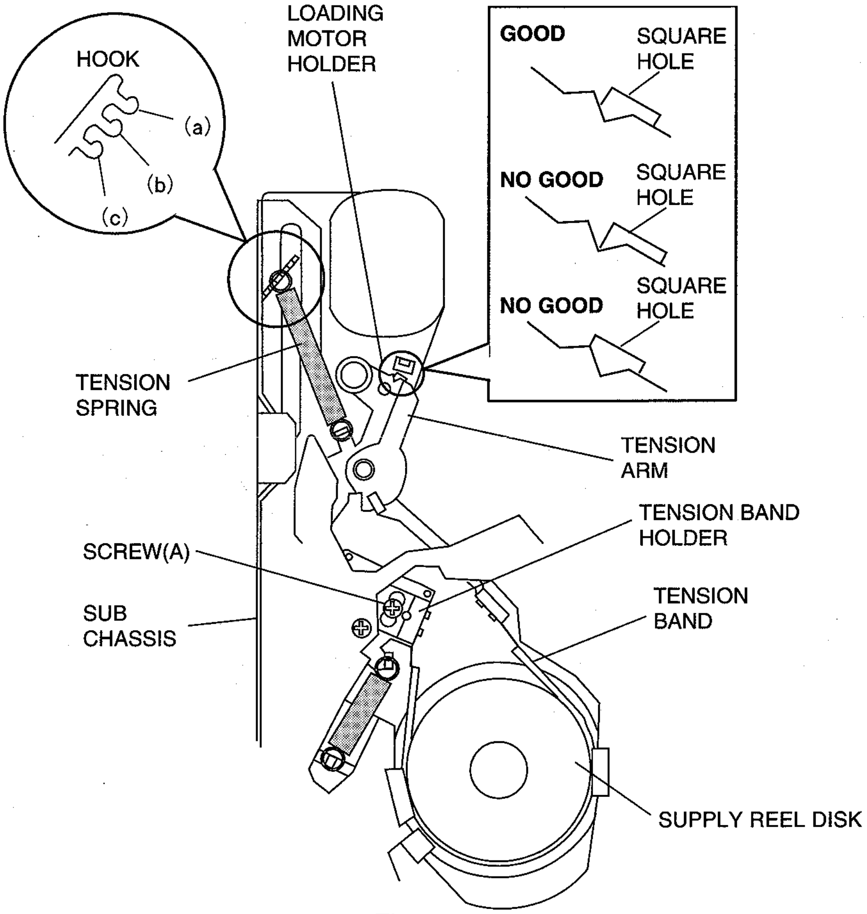

HOOK
(a)
(b)
(c)
LOADING MOTOR HOLDER
GOOD
SQUARE HOLE
NO GOOD
SQUARE HOLE
NO GOOD
SQUARE HOLE
TENSION SPRING
TENSION ARM
TENSION BAND HOLDER
SCREW(A)
SUB CHASSIS
TENSION BAND
SUPPLY REEL DISK

Fig. 3-1

3.3 Cylinder Base (Guide Roller Catchers) Height Adjustment (Fig. 3-2)

Note: Be sure to perform these adjustment after reinstalling the cylinder base.

■ **Adjustment Point**

Screws on the Cylinder Base

■ **Procedure**

(1) Turn the two screws on the cylinder base (guide roller catchers) so that the specified values can be obtained as shown. (See Fig. 3-2)

Note: After this adjustment is completed, be sure to perform "3.5 Guide Roller Height Adjustment (Adjustment After Replacing the Cylinder)".

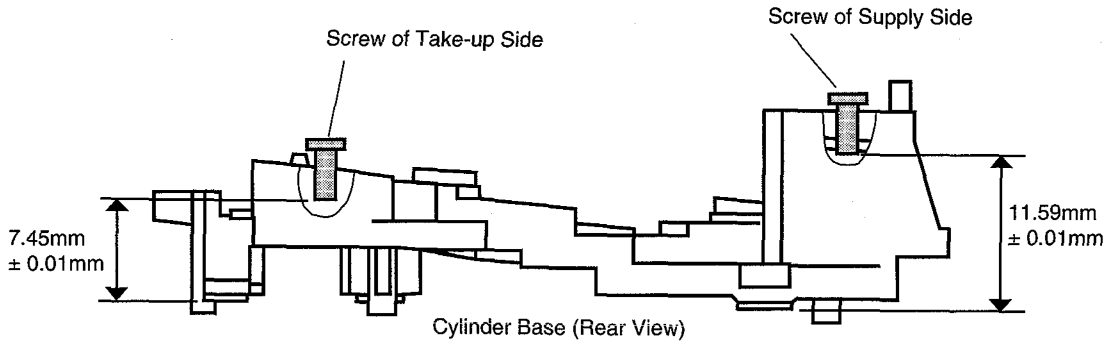

Screw of Take-up Side
Screw of Supply Side
7.45mm
± 0.01mm
11.59mm
± 0.01mm
Cylinder Base (Rear View)

Fig. 3-2

3.4 Guide Rollers Height Rough Adjustment (Fig. 3-3)

Note: Be sure to perform these adjustment after reinstalling the guide rollers.

■ **Test Equipment/Jig**

Special Drive

■ **Adjustment Point**

Top of the Guide Roller (I)

Top of the Guide Roller (O)

■ **Procedure**

(1) Turn the top of each guide roller so that the specified values can be obtained as shown. (See Fig. 3-3)

Note: After this adjustment is completed, be sure to perform "3.5 Guide Roller Height Adjustment (Adjustment After Replacing the Cylinder)".

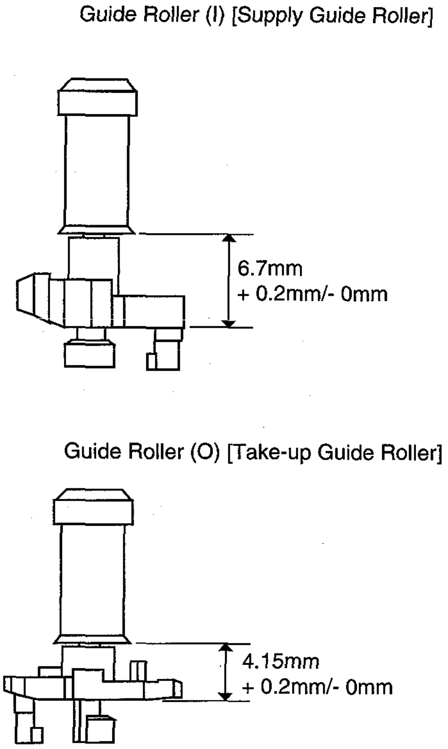

Guide Roller (I) [Supply Guide Roller]
6.7mm
+ 0.2mm/- 0mm
Guide Roller (O) [Take-up Guide Roller]
4.15mm
+ 0.2mm/- 0mm

Fig. 3-3

3.5 Guide Rollers Height Adjustment (Adjustment After Replacing Cylinder) (Figs. 3-4, 3-5)

Notes:
1. Be sure to perform this adjustment after reinstalling the guide rollers and cylinder base. Also note that before proceeding with this adjustment, the adjustment on the previous item must be completed.
2. After the cylinder is replaced, electrical circuit adjustments will also be necessary. See the service manual of each model.
3. Before performing this adjustment, refer to Fig. 3-5 and modify the ATF-R Jig.

■ Test Equipment/Jig

Alignment Tape
ATF-R Jig
(SW1: OFF, SW3: ON, RT1: Mechanical Center)
Oscilloscope
Special Drive

■ Test Point

TP1 (SW30/25) on ATF-R jig
TP2 (GND) on ATF-R jig
TP3 (FM OUT) on ATF-R jig

■ Adjustment Point

Top of the Guide Roller (I)
Top of the Guide Roller (O)

■ Procedure

(1) Loading an alignment tape that has been completely rewound.
(2) Set to the power off.
(3) Connect the ATF-R jig to the test terminal on the circuit board.
(4) Press the PLAY button and hold it, then set the POWER switch to VIDEO position.
(5) Connect an oscilloscope to TP3.
(6) Synchronize the oscilloscope with TP1.
(7) Set the oscilloscope to (+) slope.

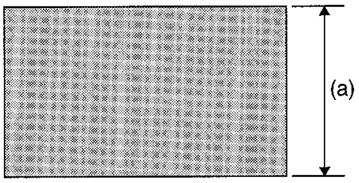
Guide Roller (I) (Fig. 3-4)

(8) Press SW2 on the ATF-R jig and hold it, then perform the following steps.
(9) Adjust the height of the guide roller (I) so the waveform is flat.
(10) Adjust the voltage level control of the oscilloscope so that portion (a) of the waveform is set to 4 graduations.
(11) Set SW1 on the ATF-R jig to ON.
(12) Turn RT1 on the ATF-R jig counterclockwise so the voltage at point (C) on the ATF-R jig is 1.8 ± 0.1V. Then check that point (b) of the waveform is set to 3 graduations.
(13) Adjust the height of the guide roller (I) so the minimum amplitude (c) of the waveform is set to more than 2 graduations.

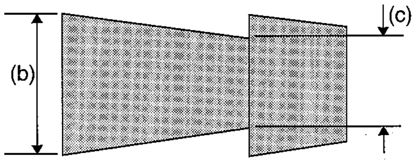
Guide Roller (O) (Fig. 3-4)

(14) Set SW1 to OFF and RT1 to mechanical center on the ATF-R jig.
(15) Set the oscilloscope to (-) slope.
(16) Perform the same procedure as for guide roller (I) hereafter. See steps (8) - (13).
(17) After completing adjustment of guide rollers (I) and (O), load the alignment tape again, and make sure that the content of this adjustment is satisfied.

Note: After adjustment is completed, be sure to disconnect the ATF-R jig from the test terminal and reverse the modification to ATF-R jig.

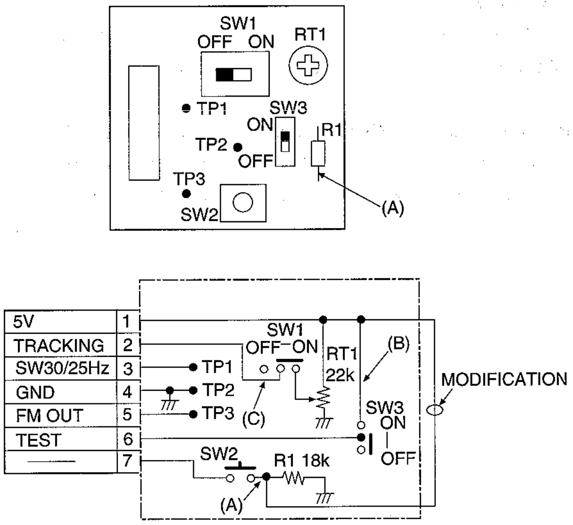


(a):4 graduations



(b):3 graduations
(c):More than 2 graduations

Fig. 3-4



Modification: Connect terminal (A) of the resistor and pin 1 (5V Line).

Fig. 3-5

3.6 OHD Arm Height Adjustment (Fig. 3-6)

Notes: 1. Be sure to perform this adjustment after reinstalling the OHD arm.
2. This adjustment minimizes minute twisting of tape that occurs between the OHD arm and capstan motor due to the structure of mechanism.
3. It is not necessary to modify the ATF-R jig.

■ **Test Equipment/Jig**

Alignments Tape
Blank Tape
ATF-R Jig (SW1: OFF, SW3: OFF)
Special Drive
Oscilloscope
Color Monitor TV

■ **Test Point**

Video Out
TP1 (SW30/25) on ATF-R jig
TP2 (GND) on ATF-R jig
TP3 (FM OUT) on ATF-R jig

■ **State of VCR**

Connect the color monitor TV to video out.
Connect the ATF-R jig to the test terminal on the circuit board.

■ **Adjustment Point**

Top of the OHD Arm

■ **Procedure**

(1) Turn power on.
(2) Load a blank tape that has been completely rewound.
(3) Set to the forward search mode.
(4) Carefully observe the tape between the OHD arm and capstan in a bright place, and make sure that minute twisting occurs on the tape. The color of tape (reflected image) at the twisted portion will appear different from the other portions. Also, twisting will look different on the left/right and up/down depending on the direction of incident light, as shown in Fig. 3-6.
(5) Adjust the height of OHD arm so that the widest portion where color of tape looks different is less than 0.5 mm.
(6) Make sure that no curling of tape occurs at either the top or the bottom flange of OHD arm. (However, even if some curling occurs at either flange, it can be judged in the allowable range if there is no scratch on the tape and there is no gap between the other flange and tape edge.)
(7) Load the blank tape that has been rewound again. Set to the forward and reverse search modes, and make sure that step (6) is satisfied.
(8) Connect an oscilloscope to TP3.
(9) Synchronize the oscilloscope with TP1.
(10) Set the oscilloscope to (+) slope.
(11) Play back the alignment tape. Set to forward search and reverse search modes, and make sure that the FM waveform does not collapse.
Also, make sure that noise bars do not fluctuate up and down on the monitor screen.
(12) If step (11) cannot be done, turn the screw on the take-up side of the cylinder base (see Fig. 3-2) counterclockwise by approx. 45°, and then perform this adjustment from the start, after doing "3.5 Guide Roller Height Adjustment (Adjustment After Replacing the Cylinder)".

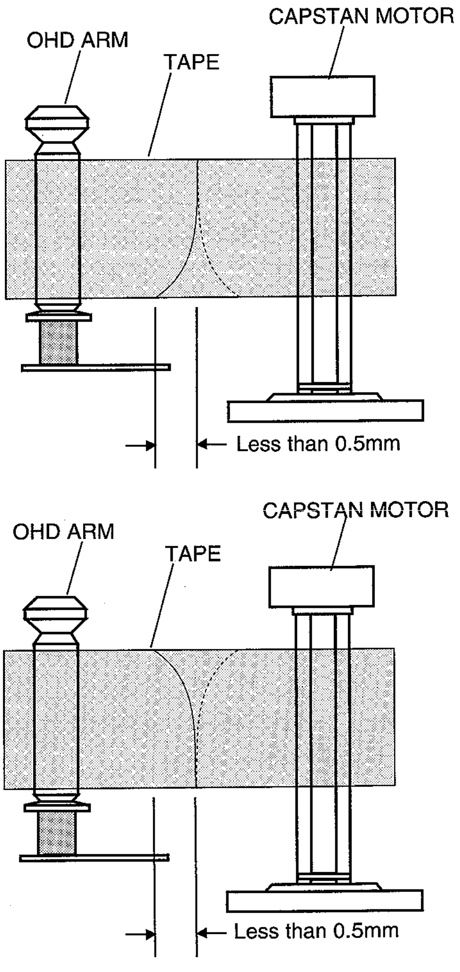


Fig. 3-6

4. CHECK THE TORQUE

There are two types of cassette torque meter.
Choose the applicable one for the measurement to be performed.

Item	VCR Mode	Measured Reel Disk	Torque Value	Torque Cassette Used
Take-up Torque	Playback	Take-up	10 ± 3 g-cm	NTSC: SRK-8T-112 or 132 PAL: SRK-8T-212 or 232
Rewind Torque	Reverse Search	Supply	31 ± 6 g-cm	NTSC: SRK-8T-132 PAL: SRK-8T-232
Take-up Brake Torque	Reverse Search to Stop	Take-up	10g-cm or more	NTSC: SRK-8T-112 or 132 PAL: SRK-8T-212 or 232
Slack Removal Torque	Unloading	Supply	25-50 g-cm	NTSC: SRK-8T-132 PAL: SRK-8T-232

CHAPTER 3 MAINTENANCE/INSPECTION PROCEDURE

1. REQUIRED MAINTENANCE

The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise to ensure compatible with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn-out parts and lubrications, is necessary.

2. SCHEDULED MAINTENANCE

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used. But, in general home use, a good picture will be maintained if the inspection and maintenance is done every 500 hours. Table 1 shows the relation between time used per day and inspection period.

Table 1

	When inspection is necessary		
Average hours used per day	About 6 months ↓	About 9 months ↓	About 18 months ↓
One hour	▨	▨	▨
Two hours	▨	▨	
Three hours	▨		

3. CHECK BEFORE STARTING REPAIRS

The faults occurring in the playback picture as shown in Table 2 can be remedied by cleaning and oiling. Check the need for lubrication and the conditions of cleanliness in the unit. Check with the customer to find out how often the unit is used. If from that you determine that the unit is ready for inspection and maintenance, check the parts shown in Table 2.

Table 2

Phenomenon	Inspection Location
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, cylinder or in tape transport system
Vertical jitter	Dirt on video head or in tape transport system
Low volume or sound distorted	Dirt on video head or worn video head

4. TOOLS NEEDED FOR INSPECTION AND MAINTENANCE

(1) Head cleaning kit
(2) VCR oil and grease (Table 3)
(3) Alcohol
(4) Gauze
(5) Cleaning tape 〔Maxell 8M-CL MCA (dry type)〕

Table 3 Locations for Greasing and Oiling

Name	Oil or Greasing Location
Sonic Slidas Oil (#1600)	Oil low-speed rotating sections
Froil (G31-SA)	Lubricate metal or molded section under light load
Molicoat (PG-641)	Lubricate metal or molded sections under light load
Lock paint	Fix adjustment screws and nuts.

5. MAINTENANCE PROCEDURE

5.1 Cleaning

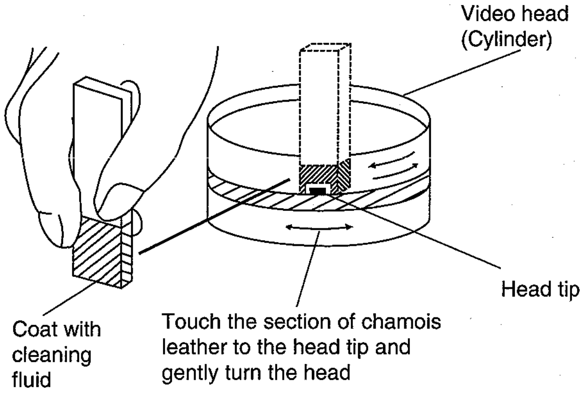
5.1.1 Cleaning Video Head

First use a cleaning tape. Be sure to use the specified cleaning tape and read its instruction sheet carefully before using it. If dirt on head is too stubborn to remove by tape, use the cleaning kit. Moisten the cleaning stick with cleaning fluid at the point indicated. Touch the stick to the head tip and gently turn the head (rotating cylinder) to the right and left. (Do not move the stick vertically and make sure that only the chamois leather on the stick comes into contact with the head. Otherwise, the head may be damaged.) Thoroughly dry the head. Then test run a tape. If cleaning fluid remains on the video head, the tape may be damaged when it comes into contact with the head surface.

5.1.2 Cleaning the Tape Transport System and Drive System, etc.

Wipe with gauze moistened with alcohol.

Notes: 1. The tape transport system is the system which comes into contact with the running tape.
The drive system consists of those parts which run the tape.
2. Make sure that during cleaning you do not touch the tape transport system with the tip of a screwdriver and that no force is applied to the system that could deform it.


Video head
(Cylinder)
Head tip
Coat with cleaning fluid
Touch the section of chamois leather to the head tip and gently turn the head

5.2 Lubrication

5.2.1 Guide Lines for Lubricating with Oil

Use the oiler to apply one or two drop or Sonic Slidas oil. Make sure not to use too match oil because it may spill over or leak out coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean with a alcohol.

5.2.2 Periodic Oil Lubrication

Lubricate the specified locations only when replacing components. Refer to the exploded views for the lubricating locations.

5.3 Greasing

5.3.1 Greasing Guide Lines

Apply grease Froil or Molicoat, with a stick or brush.
Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with gauze moistened with alcohol.

5.3.2 Periodic Greasing

Grease the specified locations only when replacing components. Refer to the exploded views for the greasing locations.

Table 4 Parts to be Maintained/Inspected and Maintenance/Inspection Schedules

Caution: The following table does not apply to all units. The maintenance/inspection schedules depend on how the unit is used and the environment in which it is used.

Hours **Component**	**500**	**1000**	**1500**	**2000**	**2500**	**3000**
Cylinder (Video Head)	C	C／R	C	C／R	C	C／R
Guide Roller (I)	C	C	C	C	C	C
Guide Roller (O)	C	C	C	C	C	C
OHD Arm	C	C	C	C	C	C
Tension Arm	C	C	C	C	C	C
Tension Band		R		R		R
Supply Reel Disk	C	C	C	C／R	C	C
Take-up Reel Disk	C	C	C	C／R	C	C
Pressure Arm	C	C	C	C／R	C	C
Timing Belt				R		
Idler				R		
Capstan Motor (Shaft)	C	C	C	C／R	C	C
Loading Motor				R		

C : Cleaning
R : Parts Replacing

Inhalt

Liste der Komponentenidentifikationen .... G 1
Vorrichtungen und Bänder für die Einstellung .... G 1

KAPITEL 1 | Demontage

1. Vor Beginn der Demontage .... G 2
  1.1 Demontagevorgang .... G 2
  1.2 Identifikation der wichtigsten mechanischen Komponenten .... G 3
2. Ausbau der mechanischen Komponenten .... G 4
  2.1 Cassettenhalter .... G 4
  2.2 Kopftrommel .... G 4
  2.3 Modusschalter, Riemenscheiben-Zahnrad, Steuerriemen .... G 4
  2.4 Zwischenradabdeckung, Zwischenrad, Mittenzahnrad, Bremse, Bremsenzahnrad, Aufwickelteller, Andruckarm, OHD-Arm, Spannband, B-Grundplatte, Spannarm, Vorratsteller .... G 5
  2.5 Bandlaufwerk-Sensorleiterplatte .... G 6
  2.6 Subchassis, ED-Arm .... G 6
  2.7 Kopftrommel-Grundplatte, Bürste .... G 7
  2.8 Führungsschiene (I), Führungsrolle (I), Führungsschiene (O), Führungsrolle (O) .... G 7
  2.9 Lademotorhalter (mit Lademotor), Capstanmotor .... G 7
  2.10 Gestänge (R), Gestänge (L), Antriebshebel, Nockenzahnrad (C), Andruckplatte, Antriebsarm, Betriebsplatte, Nockenzahnrad (B), Nockenzahnrad (A) .... G 8
  2.11 Diagramme für die Phasenanpassung der Zahnräder .... G 9
3. Methode für manuelles Entladen .... G 10
4. Foto des Bandlaufwerks .... G 11

KAPITEL 2 | Mechanische Einstellung

1. Einstellpunkte des Bandlaufwerks .... G 12
2. Vor Beginn der Einstellung .... G 12
3. Prüfung/Einstellung das Bandtransportsystems ..... G 12
  3.1 Einstellung der Spannarmposition .... G 13
  3.2 Prüfung/Einstellung des Spannmomentes .... G 13
  3.3 Einstellung der Kopftrommel-Grundplattenhöhe (Führungsrollenrasten) .... G 14
  3.4 Grobeinstellung der Führungsrollenhöhe .... G 14
  3.5 Einstellung der Führungsrollenhöhe (Einstellung nach dem Austausch der Kopftrommel) .... G 15
  3.6 Einstellung der Höhe des OHD-Armes .... G 16
4. Prüfung der Drehmomente .... G 17

KAPITEL 3 | Wartungs/Inspektionsvorgang

1. Erforderliche Wartung .... G 17
2. Regelmäßige Wartung .... G 17
3. Prüfung vor Beginn von Reparaturen .... G 17
4. Für Inspektion und Wartung erforderliche Werkzeuge .... G 18
5. Wartungsvorgang .... G 18
  5-1 Reinigen .... G 18
  5-2 Schmierung .... G 18
  5-3 Fettschmierung .... G 19

CHAPTER 4 | EXPLODED VIEW

MECHANISM 20

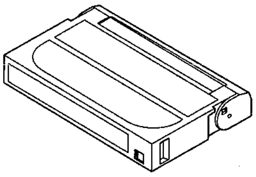
Liste der Komponentenidentifikationen

Da die Komponentenbezeichnungen in dieser Anleitung mit denen der Ersatzteilliste übereinstimmen, werden viele Abkürzungen und Kurzbezeichnungen verwendet. Die folgende Tabelle enthält die Abkürzungen für die formellen (allgemeinen) Bezeichnungen.

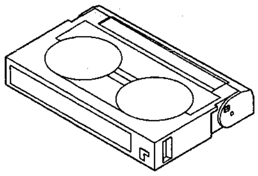
Abkürzungen	Formelle (allgemeine) Bezeichnungen	Abkürzungen	Formelle (allgemeine) Bezeichnungen
B-Grundplatte	Spannband-Grundplatte	Führungsrolle (I)	Vorratsteller-Führungsrolle
Bremse	Vorratsteller-Hilfsbremse	Führungsrolle (O)	Aufwickelteller-Führungsrolle
Bremsenzahnrad	Aufwickelteller-Bremsenzahnrad	Gestänge (L)	Vorratsteller-Gestängezahnrad
Bürste	Kopftrommelbürste	Gestänge (R)	Aufwickelteller-Gestängezahnrad
CM-Grundplatte	Capstanmotor-Grundplatte	LM-Zahnrad	Lademotor-Zahnrad
Antriebsarm	Ladeantriebsarm	Modusschalter	Bandlaufwerk-Statusschalter
Antriebshebel	Andruckrollen-Antriebshebel	OHD-Arm	Auszieharm
ED-Arm	Auswurfantriebsarm	Andruckarm	Andruckrollenarm
Führungsschiene (I)	Vorratsteller-Führungsrollenschiene	Betriebsplatte	Spannbetriebsplatte
Führungsschiene (O)	Aufwickelteller-Führungsrollenschiene		

Vorrichtungen und Bänder für die Einstellung

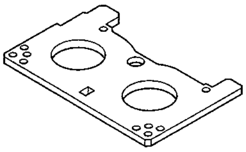
1. **Abgleichband**
   Farbbalken / 400 Hz
   Für NTSC
   20HSC-2: Nr. 7099231
   Für PAL
   20HSC-3: Nr. 7099232



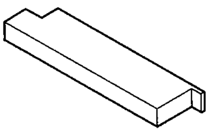
2. **Cassetten-Drehmomentmesser**
   Für NTSC
   SRK-8T-132: Nr. 7099235
   SRK-8T-112: Nr. 7099385
   Für PAL
   SRK-8T-232: Nr. 7099236
   SRK-8T-212: Nr. 7099402



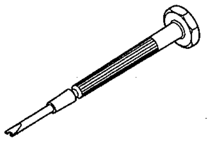
3. **Hauptmeßlehre**
   Nr. 7099237



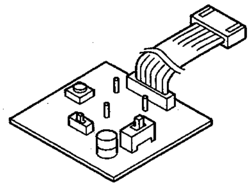
4. **Wickelteller-Höhen-einstellehre**
   Nr. 7099238



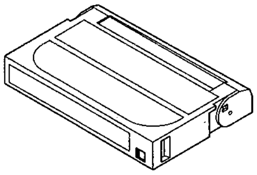
5. **Spezialschraubendreher**
   Nr. 7099239



6. **ATF-R Vorrichtung** (*1,*2)
   Nr. 7069461



7. **Leercassette**
   Für NTSC: P6-120
   Für PAL: P5-90



(im Fachhandel erhältlich)

*1: Immer den Schalter SW3 auf der ATF-R Vorrichtung einschalten (Position ON).
*2: Die ATF Vorrichtung (Nr. 7099386) kann auch anstelle der ATF-R Vorrichtung für die Einstellung dieses Modells verwendet werden.

Kapitel 1 Demontage

1. Vor Beginn der Demontage

(1) Das UH-Bandlaufwerk muß grundsätzlich im entladenden Stoppstatus demontiert werden. Um das Bandlaufwerk manuell in den entladenden Stoppstatus zu bringen, siehe "3. Methode für manuelles Entladen".

(2) Die einzelnen Komponenten gemäß "1.1. Demontagevorgang" demontieren.

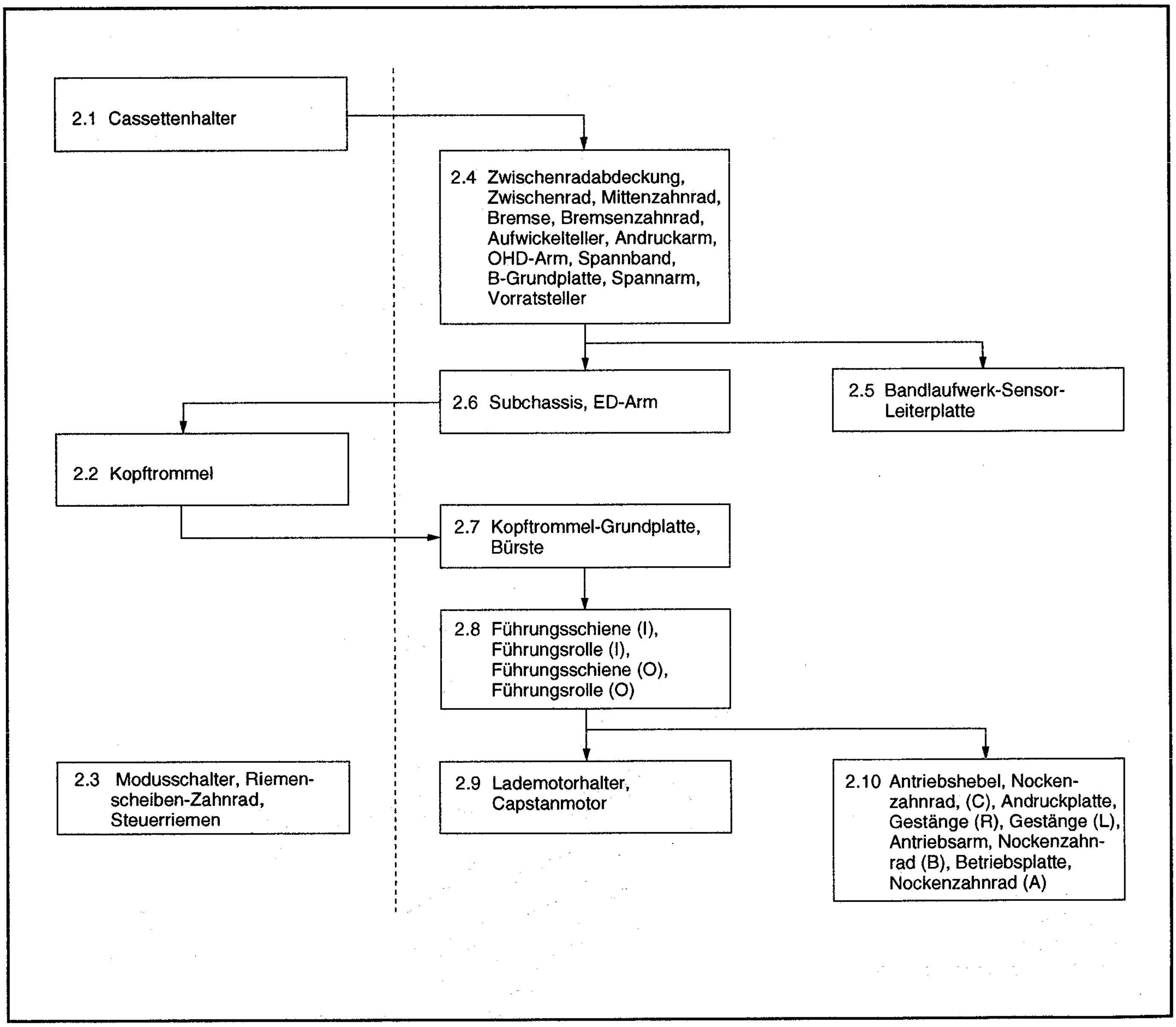
(3) Für den Wiederzusammenbau sind die Demontagevorgänge sinngemäß umzukehren, wenn es nicht anders aufgeführt ist.

(4) Die ausgebauten Unterlegescheiben dürfen nicht wiederverwendet werden.

(5) Da die Komponentenbezeichnungen in dieser Anleitung mit denen in der Ersatzteilliste übereinstimmen, werden viele Abkürzungen und Kurzbezeichnungen verwendet. Für die formellen (allgemeinen) Bezeichnungen siehe die Tabelle auf der ersten Seite dieser Anleitung.

1.1 Demontagevorgang

Hinweis: Die Komponenten links von der gestrichten Linie können unabhängig von den anderen Komponenten ausgebaut werden.


2.1 Cassettenhalter
2.4 Zwischenradabdeckung, Zwischenrad, Mittenzahnrad, Bremse, Bremsenzahnrad, Aufwickelteller, Andruckarm, OHD-Arm, Spannband, B-Grundplatte, Spannarm, Vorratsteller
2.6 Subchassis, ED-Arm
2.5 Bandlaufwerk-Sensor-Leiterplatte
2.2 Kopftrommel
2.7 Kopftrommel-Grundplatte, Bürste
2.8 Führungsschiene (I), Führungsrolle (I), Führungsschiene (O), Führungsrolle (O)
2.3 Modusschalter, Riemenscheiben-Zahnrad, Steuerriemen
2.9 Lademotorhalter, Capstanmotor
2.10 Antriebshebel, Nockenzahnrad, (C), Andruckplatte, Gestänge (R), Gestänge (L), Antriebsarm, Nockenzahnrad (B), Betriebsplatte, Nockenzahnrad (A)

1.2 Identifikation der wichtigsten mechanischen Komponenten

1.2.1 Draufsicht

1. Kopftrommel
2. Capstanmotor
3. Führungsschiene (O)
   (Aufwickelteller-Führungsrollen-schiene)
4. Führungsrolle (O)
   (Aufwickelteller-Führungsrolle)
5. OHD-Arm (Auszieharm)
6. Andruckarm (Andruckrollenarm)
7. Aufwickelteller
8. Bandlaufwerk-Sensorleiterplatte
9. Zwischenradabdeckung
10. Zwischenrad
11. Subchassis
12. Vorratsteller
13. Gestänge (R)
    (Aufwickelteller-Gestängezahnrad)
14. Gestänge (L)
    (Vorratsteller-Gestängezahnrad)
15. Spannband
16. Führungsrolle (I)
    (Vorratsteller-Führungsrolle)
17. Spannarm
18. Führungsschiene (I)
    (Vorratsteller-Führungsrollen-schiene)
19. Hauptchassis
20. Lademotorhalter
21. Kopftrommel-Grundplatte

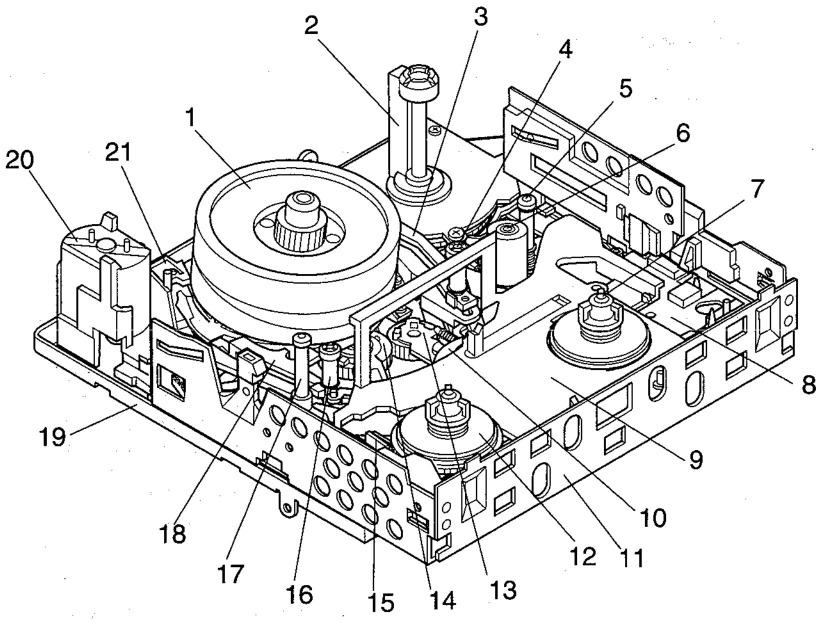
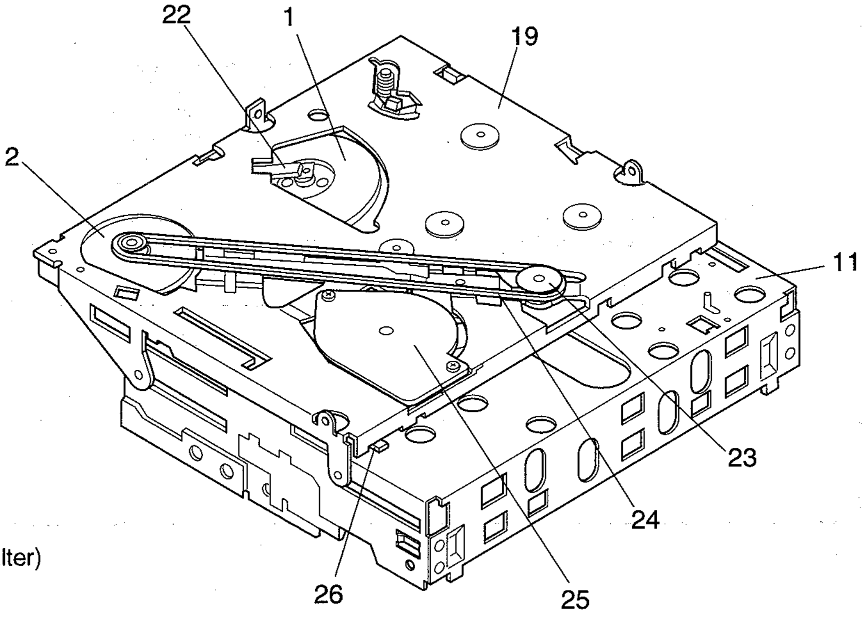


Abb. 1-1

1.2.2 Bodenansicht



1. Kopftrommel
2. Capstanmotor
11. Subchassis
19. Hauptchassis
22. Bürste (Kopftrommelbürste)
23. Riemenscheiben-Zahnrad
24. Steuerriemen
25. Modusschalter (Bandlaufwerk-Statusschalter)
26. ED-Arm (Auswurfantriebsarm)

Abb. 1-2

2. Ausbau der mechanischen Komponenten

2.1 Cassettenhalter

Hinweis: Falls der Cassettenhalter nicht angehoben wird, die Auswurfverriegelung (EJECT LOCK) des Halters bewegen, um den Halter anzuheben (siehe Abb. 2-1).

(1) Die E-Ringe entfernen, mit welchen der Cassettenhalter an der linken und rechten Seite befestigt ist (siehe Abb. 2-1).
(2) Die mit dem Subchassis verbundenen Abschnitte der vorderen Arme (L&R) des Halters verwenden, um die hinteren Arme (L&R) in Richtung des Pfeiles anzuheben.
(3) Die vorderen Arme (L&R) von dem Subchassis freigeben und den Cassettenhalter abnehmen.

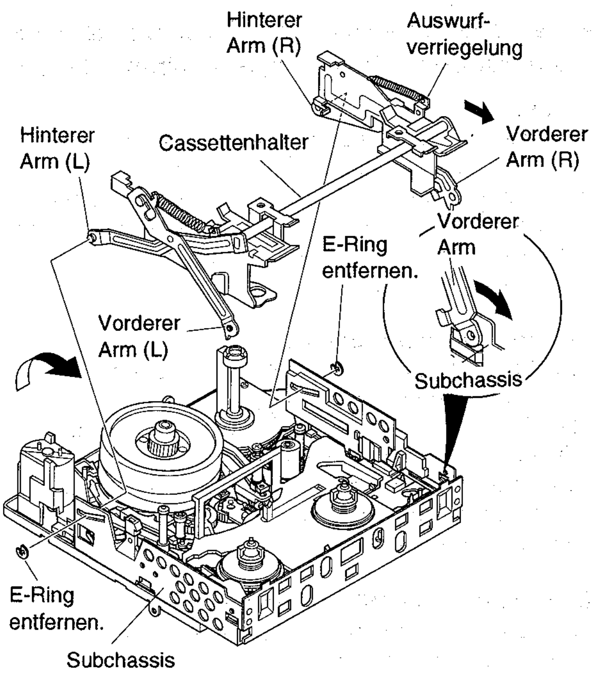

Hinterer Arm (R)
Auswurf-verriegelung
Hinterer Arm (L)
Cassettenhalter
Vorderer Arm (R)
Vorderer Arm
E-Ring entfernen.
Vorderer Arm (L)
Subchassis
E-Ring entfernen.
Subchassis

Abb. 2-1

2.2 Kopftrommel

Hinweis: Darauf achten, daß Sie während der Arbeiten die Spitze der Videoköpfe nicht mit Ihren Fingern, den Werkzeugen usw. berühren.

(1) Drei Schrauben entfernen (siehe Abb. 2-2).

Wiedereinbau und Vorsicht:

1. Nach dem Wiedereinbau der Kopftrommel, unbedingt die folgenden mechanischen Einstellungen vornehmen.
   Führungsrollen-Höheneinstellung (Einstellung nach dem Austausch der Kopftrommel)

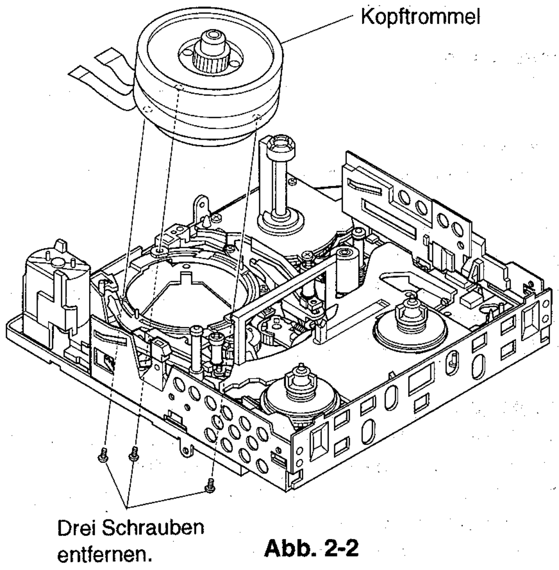

Kopftrommel
Drei Schrauben entfernen.

Abb. 2-2

2.3 Modusschalter, Riemenscheiben-Zahnrad, Steuerriemen

Hinweis: Diese Komponenten entfernen, bevor das Zwischenzahnrad im nächsten Abschnitt ausgebaut wird.

■Modusschalter

(1) Eine Schraube entfernen (siehe Abb. 2-3).

Wiedereinbau und Vorsicht:

1. Auf richtige Phase der Zahnräder achten (siehe Abb. 2-3 (B), Abb. 2-14 und Abb. 2-15).

■Riemenscheiben-Zahnrad, Steuerriemen

(1) Eine Unterlegescheibe entfernen (siehe Abb. 2-3(A)).
(2) Das Riemenscheiben-Zahnrad hochziehen und den Steuerriemen abnehmen.

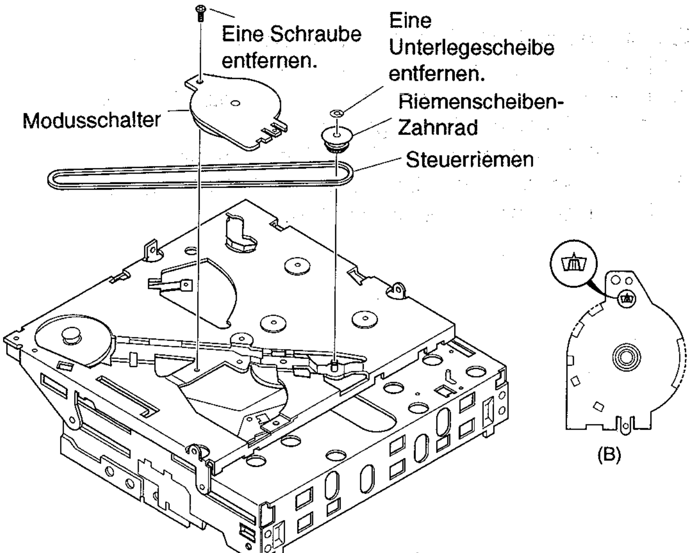

Eine Schraube entfernen.
Eine Unterlegescheibe entfernen.
Modusschalter
Riemenscheiben-Zahnrad
Steuerriemen
(B)

Abb. 2-3

2.4 Zwischenradabdeckung, Zwischenrad, Mittenzahnrad, Bremse, Bremsenzahnrad, Aufwickelteller, Andruckarm, OHD-Arm, Spannband, B-Grundplatte, Spannarm, Vorratsteller

Hinweise:

1. Niemals das Subchassis umdrehen, wenn die Zwischenradabdeckung entfernt wurde.
2. Um das Subchassis von dem Hauptchassis zu trennen, nur die mit @ markierten Komponenten entfernen und mit dem unter "2.6. Subchassis und ED-Arm" beschriebenen Ausbau fortsetzen.

■Zwischenradabdeckung (@)

(1) Die Feder (a) zwischen der Bremse und dem Subchassis freigeben (siehe Abb. 2-4).
(2) Die Feder (b) zwischen dem Andruckarm und der Zwischenradabdeckung freigeben.
(3) Die Feder (c) zwischen der B-Grundplatte und der Zwischenradabdeckung freigeben.
(4) Vier Schrauben entfernen.

■Zwischenrad (@), Mittenzahnrad

(5) Das Zwischenrad entfernen (siehe Abb. 2-4).
(6) Das Mittenzahnrad hochziehen.

■Bremse (@)

(5) Die Bremse entfernen (siehe Abb. 2-4).

■Bremsenzahnrad

(5) Das Bremsenzahnrad hochziehen (siehe Abb. 2-4).

■Aufwickelteller

(5) Den Aufwickelteller hochziehen (siehe Abb. 2-4).

■Andruckarm, OHD-Arm

(5) Den Andruckarm hochziehen (siehe Abb. 2-4).
(6) Die Feder (d) zwischen dem Subchassis und dem OHD-Arm freigeben.
(7) Den OHD-Arm herausziehen.

Wiedereinbau und Vorsicht:

1. Der Andruckarm und der OHD-Arm müssen in der in Abb. 2-6(B) gezeigten Position eingebaut werden.
2. Nach dem Wiedereinbau des OHD-Arms, unbedingt die folgende mechanische Einstellung vornehmen.
   OHD-Arm-Höheneinstellung

■Spannband, B-Grundplatte, Spannarm

(5) Die Spannfeder freigeben (siehe Abb. 2-4).
(6) Eine Schraube entfernen, mit der das Spannband und die B-Grundplatte befestigt sind.
(7) Das Spannband mit dem Spannarm entfernen.
(8) Das Spannband von dem Spannarm in Richtung des Pfeiles abnehmen (siehe Abb. 2-5).

Wiedereinbau und Vorsicht:

1. Der Spannarm und das Spannband müssen an den in Abb. 2-6(A) gezeigten Positionen eingebaut werden.
2. Nach dem Wiedereinbau des Spannbandes und der Spannfeder, unbedingt die folgenden mechanischen Einstellungen vornehmen.
   Spannarm-Positionseinstellung
   Prüfung/Einstellung des Spannmoments

■Vorratsteller

(9) Den Vorratsteller hochziehen (siehe Abb. 2-4).

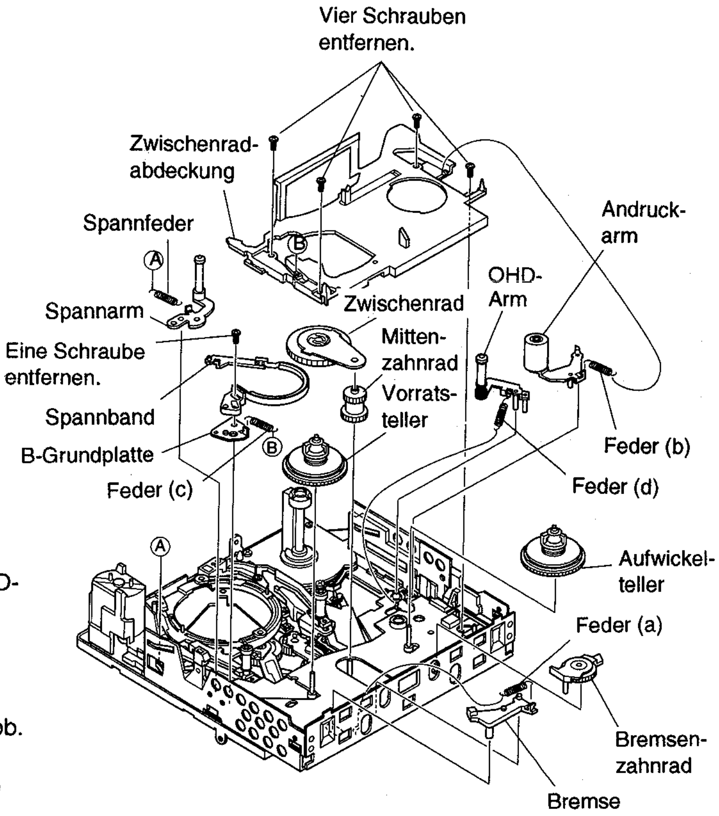

Vier Schrauben entfernen.
Zwischenrad-abdeckung
Andruck-arm
Spannfeder
Ⓐ
Ⓑ
OHD-Arm
Spannarm
Zwischenrad
Eine Schraube entfernen.
Mitten-zahnrad
Vorrats-teller
Spannband
Ⓑ
B-Grundplatte
Feder (b)
Feder (c)
Feder (d)
Ⓐ
Aufwickel-teller
Feder (a)
Bremsen-zahnrad
Bremse

Abb. 2-4

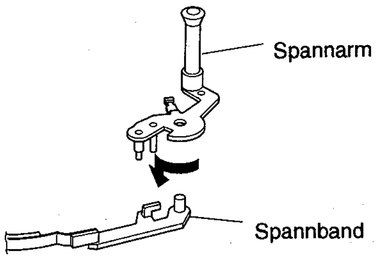

Spannarm
Spannband

Abb. 2-5

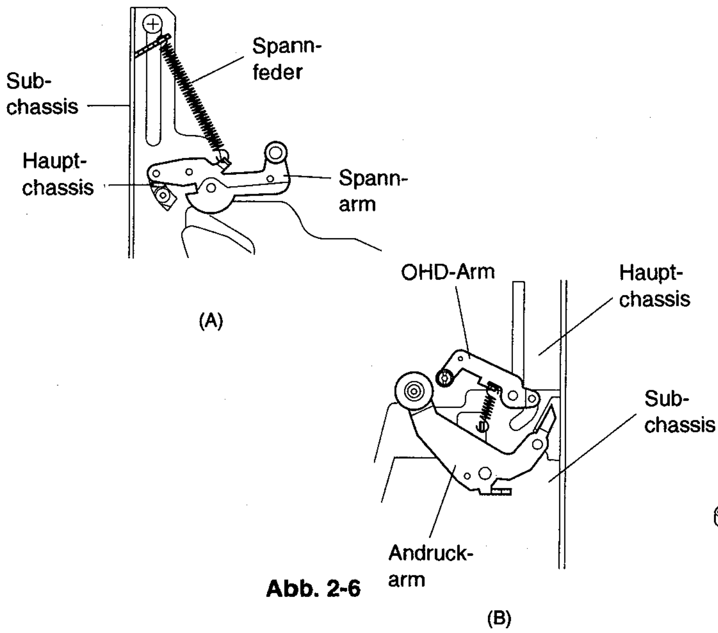

Sub-
chassis
Spann-
feder
Haupt-
chassis
Spann-
arm
(A)
OHD-Arm
Haupt-
chassis
Sub-
chassis
Andruck-
arm
(B)

Abb. 2-6

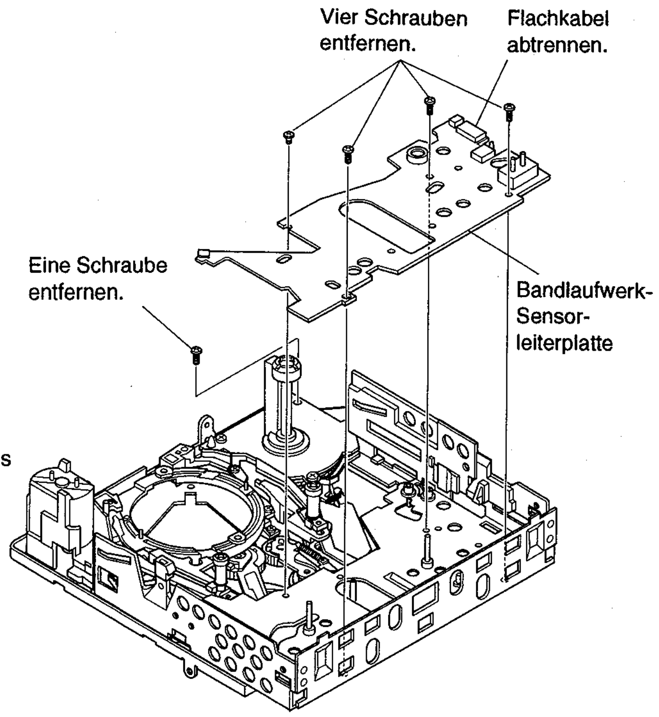

Vier Schrauben
entfernen.
Flachkabel
abtrennen.
Eine Schraube
entfernen.
Bandlaufwerk-
Sensor-
leiterplatte

Abb. 2-7

2.5 Bandlaufwerk-Sensorleiterplatte

(1) Das Flachkabel abtrennen (siehe Abb. 2-7).
(2) Vier Schrauben entfernen.
(3) Eine Schraube entfernen.

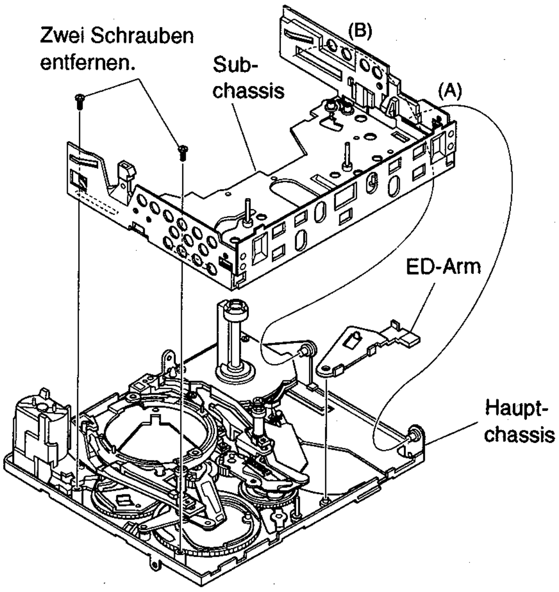

Zwei Schrauben
entfernen.
Sub-
chassis
(B)
(A)
ED-Arm
Haupt-
chassis

Abb. 2-8

2.6 Subchassis, ED-Arm

(1) Zwei Schrauben entfernen (siehe Abb. 2-8).
(2) Die mit dem Hauptchassis verbundenen Abschnitte (A) und (B) freigeben.
(3) Den ED-Arm entfernen.

Wiedereinbau und Vorsicht:

1. Der ED-Arm muß in der in Abb. 2-9(A) gezeigten Position eingebaut werden.
2. Das Subchassis so einbauen, daß die Abschnitte (A) und (B) mit dem Hauptchassis verbunden sind (siehe Abb. 2-8).
3. Das Subchassis so einbauen, daß der Überstand des Nockenzahnrades (B) und die Schraube auf die in Abb. 2-9 (B) gezeigten Positionen eingestellt sind.

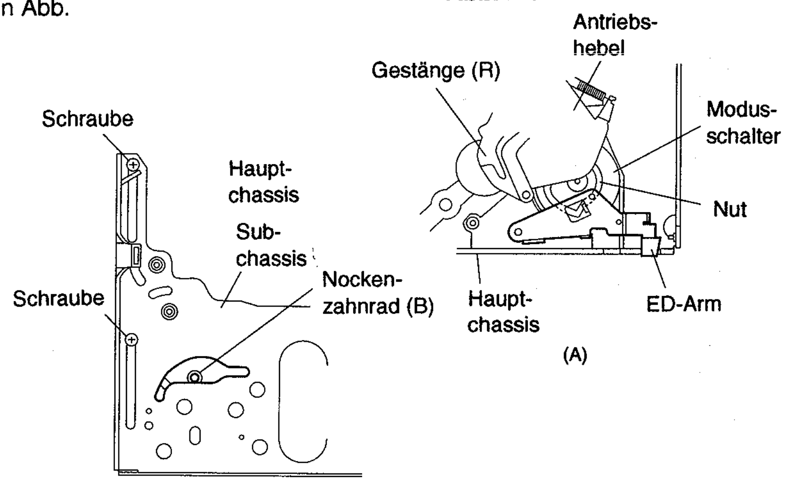

Antriebs-
hebel
Gestänge (R)
Modus-
schalter
Nut
Haupt-
chassis
ED-Arm
(A)
Schraube
Haupt-
chassis
Sub-
chassis
Nocken-
zahnrad (B)
Schraube
(B)

Abb. 2-9

2.7 Kopftrommel-Grundplatte, Bürste

(1) Drei Schrauben entfernen (siehe Abb. 2-10).
(2) Eine Schraube entfernen.

Wiedereinbau und Vorsicht:

1. Nach dem Wiedereinbau der Kopftrommel-Grundplatte, unbedingt die folgenden mechanischen Einstellungen vornehmen.
   Kopftrommel-Grundplatten-Höheneinstellung
   Führungsrollen-Höheneinstellung

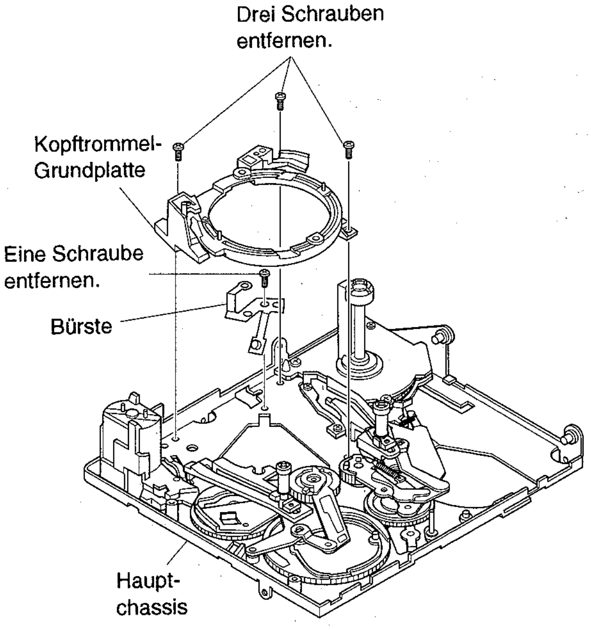

Drei Schrauben entfernen.
Kopftrommel-Grundplatte
Eine Schraube entfernen.
Bürste
Haupt-chassis

Abb. 2-10

2.8 Führungsschiene (I), Führungsrolle (I), Führungsschiene (O), Führungsrolle (O)

Wiedereinbau und Vorsicht:

1. Nach dem Wiedereinbau der Führungsrolle (I) oder (O), unbedingt die folgenden mechanischen Einstellungen vornehmen.
   Führungsrollenhöhen-Grobeinstellung
   Führungsrollen-Höheneinstellung

■Führungsschiene (I), Führungsrolle (I)

(1) Eine Schraube entfernen (siehe Abb. 2-11).
(2) Die Führungsschiene (I) mit der Führungsrolle (I) in Richtung des Pfeiles drehen (parallel mit dem Hauptchassis), um die Führungsrolle (I) von dem Gestänge (L) freizugeben.
(3) Die Führungsrolle (I) in Laderichtung bewegen, um diese von der Führungsschiene (I) abzunehmen.

■Führungsschiene (O), Führungsrolle (O)

(1) Zwei Schrauben entfernen (siehe Abb. 2-11).
(2) Die Führungsschiene (O) mit der Führungsrolle (O) in Richtung des Pfeiles drehen (parallel mit dem Hauptchassis), um die Führungsrolle (O) von dem Gestänge (R) freizugeben.
(3) Die Führungsrolle (O) in Laderichtung bewegen, um diese von der Führungsschiene (O) abzunehmen.

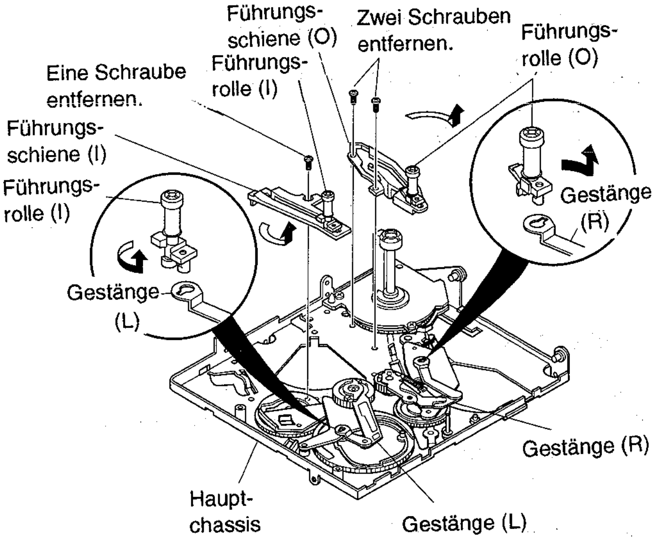

Führungs-schiene (O)
Zwei Schrauben entfernen.
Führungs-rolle (O)
Eine Schraube entfernen.
Führungs-rolle (I)
Führungs-schiene (I)
Führungs-rolle (I)
Gestänge (R)
Gestänge (L)
Gestänge (R)
Haupt-chassis
Gestänge (L)

Abb. 2-11

2.9 Lademotorhalter (mit Lademotor), Capstanmotor

■Lademotorhalter

(1) Drei Laschen freigeben (siehe Abb. 2-12).

Wiedereinbau und Vorsicht:

1. Auf richtige Phase der Zahnräder achten (siehe Abb. 2-14 und Abb. 2-15).
2. Falls die Führungsschiene (I) entfernt wurde, den Lademotor vor der Führungsschiene (I) einbauen.

■Capstanmotor

(1) Zwei Schrauben entfernen (siehe Abb. 2-12).
(2) Den Steuerriemen abnehmen.

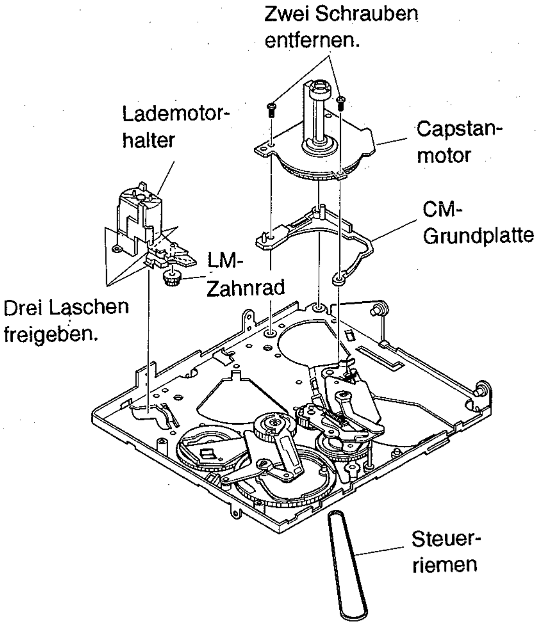

Zwei Schrauben entfernen.
Lademotor-halter
Capstan-motor
CM-Grundplatte
LM-Zahnrad
Drei Laschen freigeben.
Steuer-riemen

Abb. 2-12

2.10 Gestänge (R), Gestänge (L), Antriebshebel, Nockenzahnrad (C), Andruckplatte, Antriebsarm, Betriebsplatte, Nockenzahnrad (B), Nockenzahnrad (A)

Wiedereinbau und Vorsicht:

1. Wenn eine der folgenden Komponenten eingebaut wird, den Modusschalter einbauen und auf richtige Phase der Zahnräder achten (siehe Abb. 2-14 und Abb. 2-15).
2. Falls der Lademotorhalter entfernt wurde, diesen einbauen, wobei auf richtige Phase der Zahnräder geachtet werden muß, wie es oben dargestellt ist.

■Gestänge (R), Gestänge (L)

(1) Eine Unterlegescheibe (a) entfernen und das Gestänge (R) abnehmen (siehe Abb. 2-13).
(2) Eine Unterlegescheibe (b) entfernen und das Gestänge (L) abnehmen.

■Antriebshebel, Nockenzahnrad (C), Andruckplatte

Hinweis: Die Feder zwischen dem Antriebshebel und der Andruckplatte ist sehr stark. Diese Feder daher wie folgt aus- und einbauen:

(3) Eine Unterlegescheibe (c) entfernen (siehe Abb. 2-13).
(4) Den Antriebshebel von dem Hauptchassis abnehmen, wobei die Feder zwischen dem Antriebshebel und der Andruckplatte freizugeben ist.
(5) Eine Unterlegescheibe (d) entfernen und die Andruckplatte abnehmen.
(6) Eine Unterlegescheibe (e) entfernen und das Nockenzahnrad (C) abnehmen.

Wiedereinbau des Antriebshebels und Vorsicht:

1. Der Lademotor und der Modusschalter müssen bei richtiger Phase der Zahnräder eingebaut werden.
2. Vor dem Einbau des Antriebshebels in der normalen Position (wie in Abb. 2-15 gezeigt), die Feder zwischen dem Antriebshebel und der Andruckplatte einhängen.
3. Die Andruckplatte mit einer Pinzette usw. in der normalen Position (wie in Abb. 2-15 gezeigt) anbringen und den Antriebshebel in der normalen Position einbauen.

■ Antriebsarm, Betriebsplatte, Nockenzahnrad (B), Nockenzahnrad (A)

(3) Eine Unterlegescheibe (f) entfernen und den Antriebsarm abnehmen (siehe Abb. 2-13).
(4) Die Betriebsplatte entfernen.
(5) Eine Unterlegescheibe (g) entfernen und das Nockenzahnrad (B) abnehmen.
(6) Eine Unterlegescheibe (h) entfernen und das Nockenzahnrad (A) abnehmen.

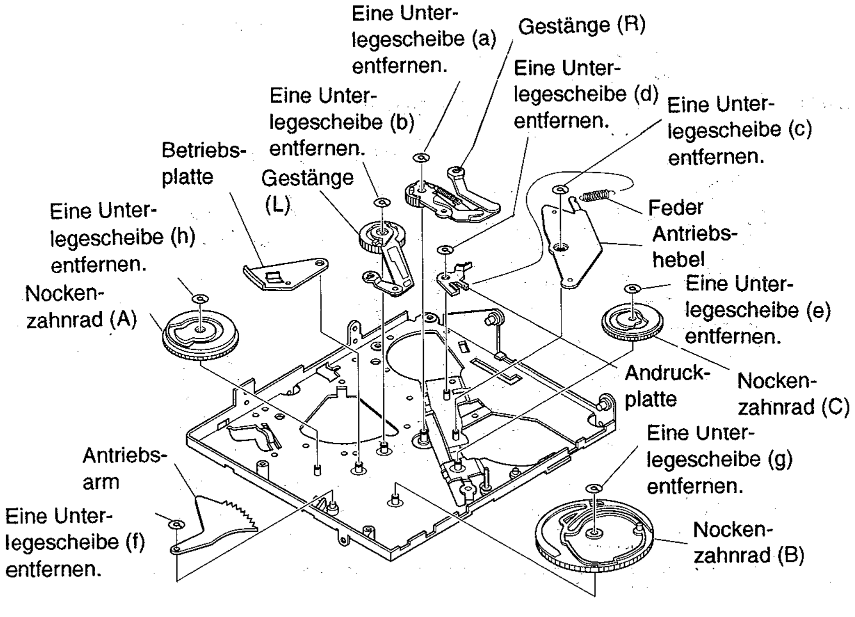

Eine Unterlegescheibe (a) entfernen.
Gestänge (R)
Eine Unterlegescheibe (d) entfernen.
Eine Unterlegescheibe (b) entfernen.
Eine Unterlegescheibe (c) entfernen.
Betriebsplatte
Gestänge (L)
Feder
Eine Unterlegescheibe (h) entfernen.
Antriebshebel
Nockenzahnrad (A)
Eine Unterlegescheibe (e) entfernen.
Andruckplatte
Nockenzahnrad (C)
Eine Unterlegescheibe (g) entfernen.
Antriebsarm
Eine Unterlegescheibe (f) entfernen.
Nockenzahnrad (B)

Abb. 2-13

2.11 Diagramme für die Phasenanpassung der Zahnräder

Die folgenden Diagramme zeigen die Phasenanpassung der Zahnräder in dem entladenen Stoppstatus.

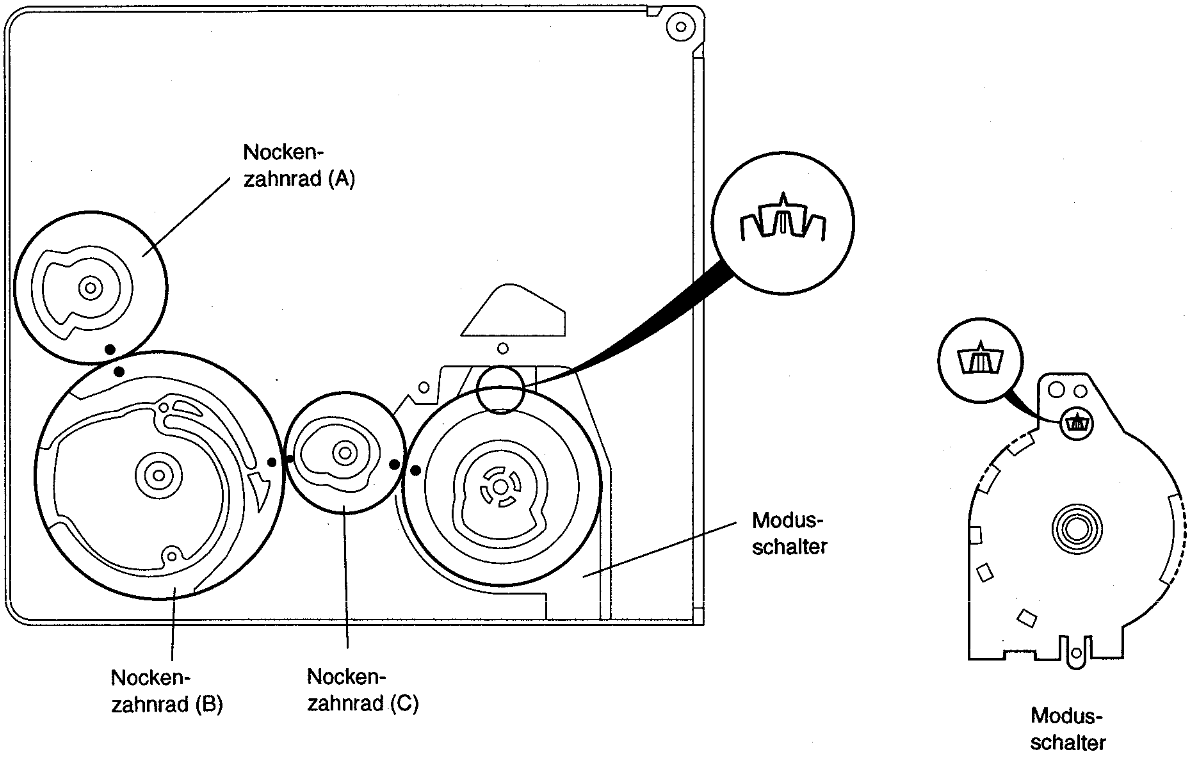

Nocken-zahnrad (A)
Modus-schalter
Nocken-zahnrad (B)
Nocken-zahnrad (C)
Modus-schalter

Abb. 2-14

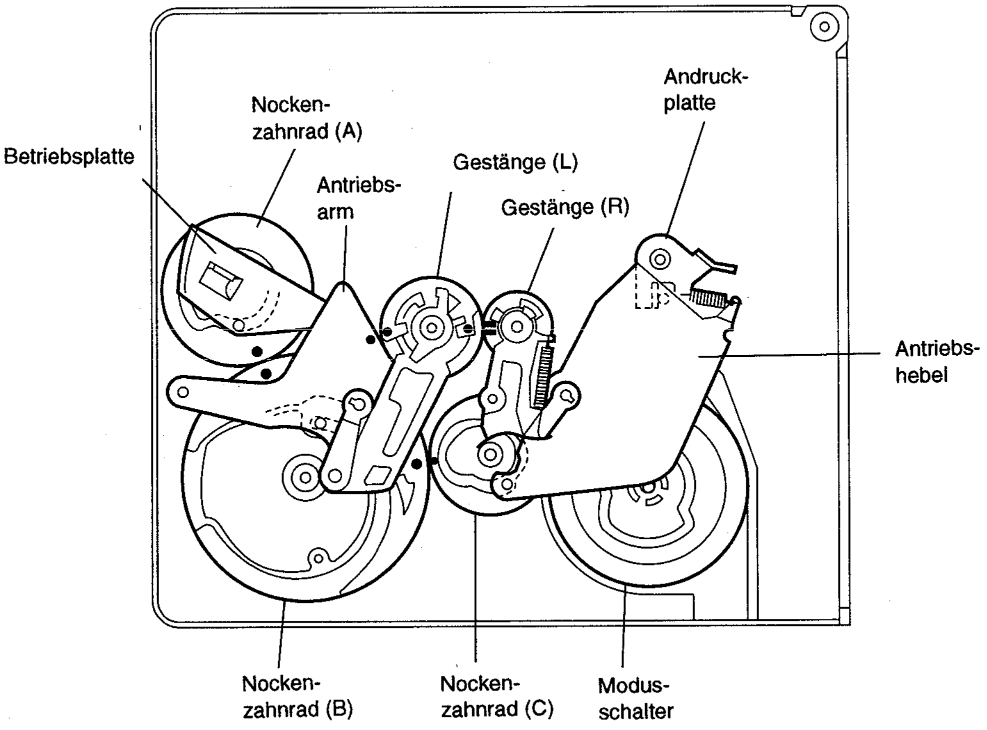

Andruck-platte
Nocken-zahnrad (A)
Betriebsplatte
Gestänge (L)
Antriebs-arm
Gestänge (R)
Antriebs-hebel
Nocken-zahnrad (B)
Nocken-zahnrad (C)
Modus-schalter

Abb. 2-15

3. Methode für manuelles Entladen

Vorsicht: Diesen Vorgang nur im Notfall ausführen, wenn das normale Entladen aufgrund eines defekten elektrischen Schaltkreises oder Lademotors nicht möglich ist.

1) Zwei Laschen freigeben und den Lademotor aus dem Lademotorhalter herausziehen (siehe Abb. 3-1).

Hinweis: Der obige Ausbau unterscheidet sich von dem normalen Ausbau. Unter normalen Umständen ist der Lademotor gemeinsam mit dem Lademotorhalter auszubauen. (Der Lademotor und der Lademotorhalter stellen eine Baugruppe dar.)

2) Das Bandlaufwerk umdrehen.

Hinweis: Das Bandlaufwerk niemals umdrehen, wenn die Zwischenradabdeckung entfernt ist.

3) Einen Schlitzschraubendreher usw. verwenden, um das Nockenzahnrad (A) oder das Nockenzahnrad (B) in Richtung der Pfeile zu drehen.

Hinweise:

1. Darauf achten, daß die Nockenzahnräder nicht beschädigt werden.
2. Falls das Band geladen ist, den Capstanmotor manuell drehen, um das Band aufzuspulen.

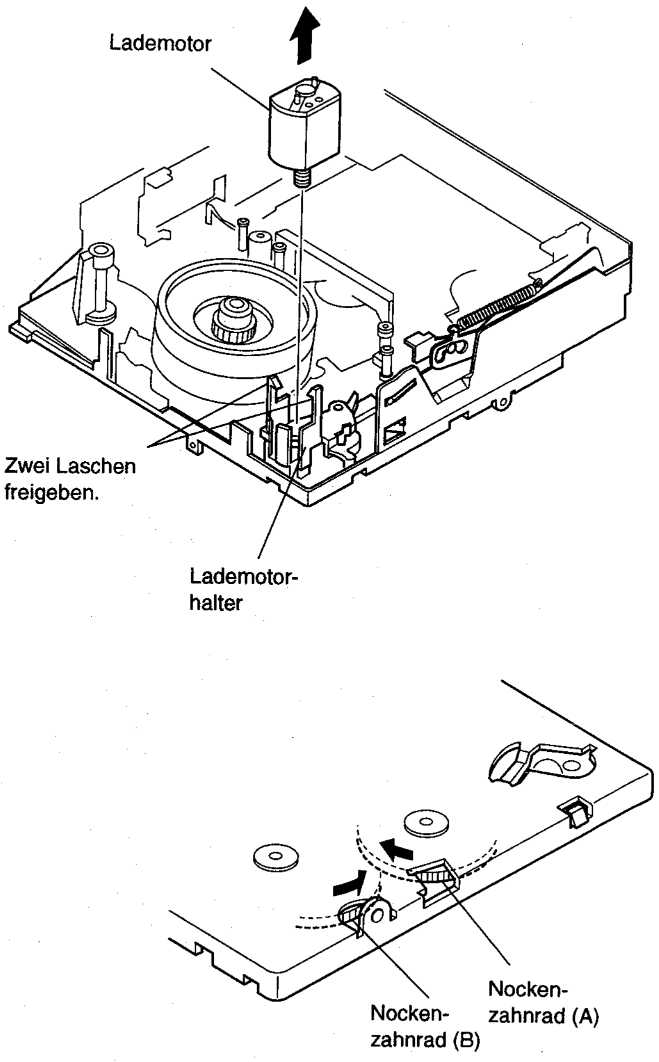
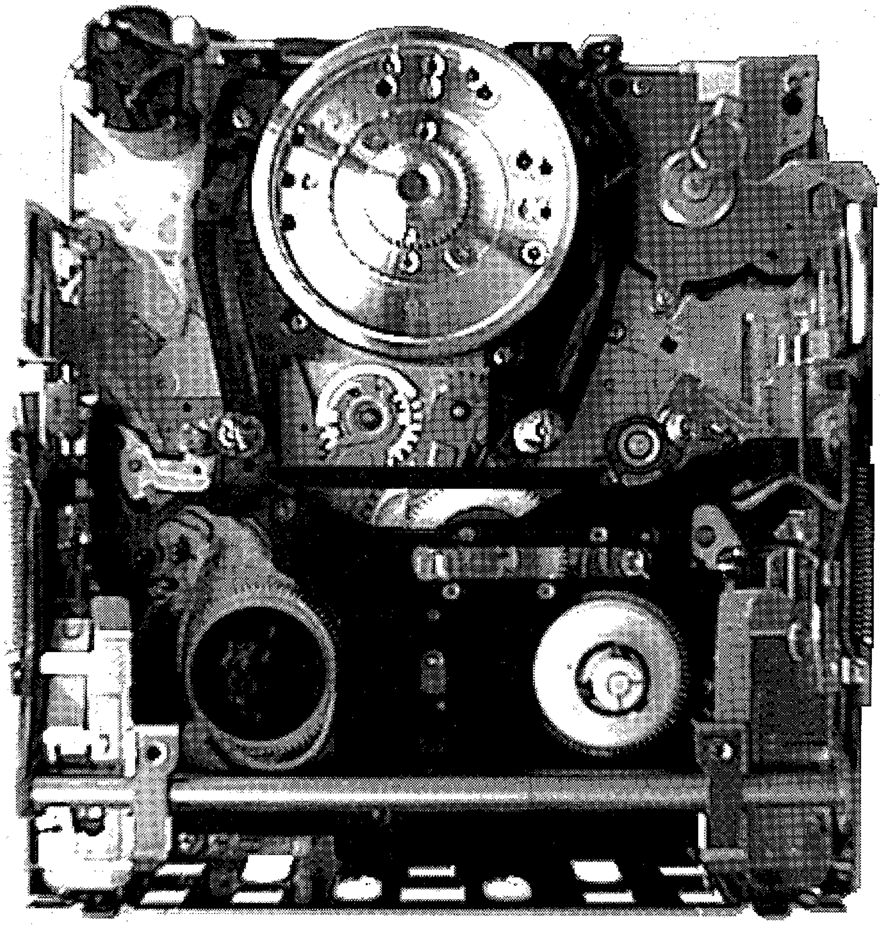
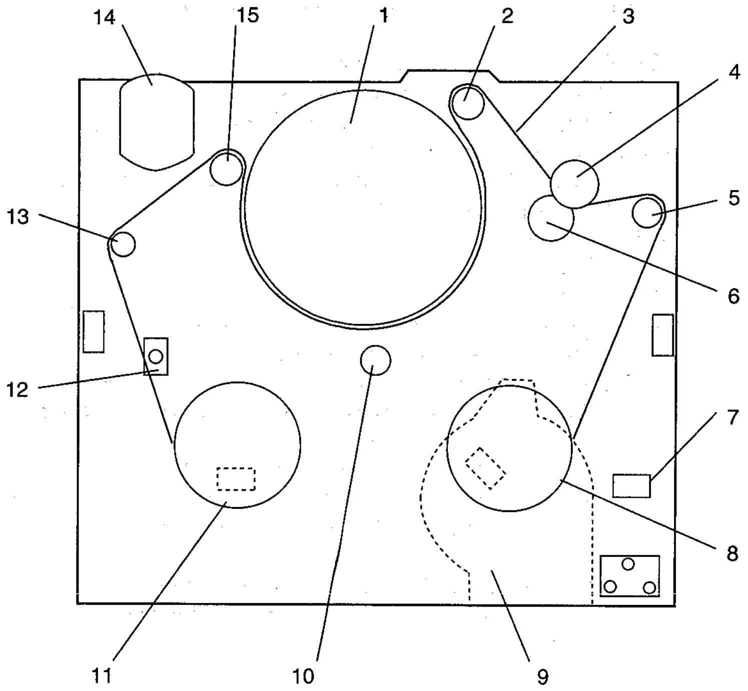


Abb. 3-1

4. Foto des Bandlaufwerks



1. Einstellpunkte des Bandlaufwerks



1. Kopftrommel
2. Führungsrolle (O) (Aufwickelteller-Führungsrolle)
3. Band
4. Capstanmotor
5. OHD-Arm (Auszieharm)
6. Andruckarm (Andruckrolle)
7. Cassettenhalterschalter
8. Aufwickelteller
9. Modusschalter (Bandlaufwerk-Statusschalter)
10. Ende-LED
11. Vorratsteller
12. Spannbandhalter
13. Spannarm (Spannstift)
14. Lademotor
15. Führungsrolle (I) (Vorratsteller)

Abb. 1-1

2. Vor Beginn der Einstellung

(1) Für die Demontage und den Wiederzusammenbau des Bandlaufwerkes sowie für die Phasenanpassung der Zahnräder siehe "Kapitel 1 Demontage".

(2) Nachfolgend ist die Methode beschrieben, wie das Bandlaufwerk auf den Wiedergabemodus geschaltet werden kann, ohne eine Cassette einzusetzen (eine Leiterplatte mit den Bandlaufwerk-Schaltkreisen muß angeschlossen werden):
Der Wiedergabemodus kann durch keinen der folgenden Vorgänge aufrecht erhalten werden, da der Wickelteller nicht dreht usw.:
   1) Das Bandlaufwerk auf den Entladestopp- oder Auswurfmodus stellen.
   2) Das Licht von den Ende-LEDs abdecken.
   3) Den Cassettenhalter absenken.
   4) Die Wiedergabetaste drücken.

(3) Nachfolgend ist der Vorgang für das Laden und Entladen eines demontierten Bandlaufwerkes beschrieben:
   1) Eine Gleichspannung von 4 V an die Klemmen des Lademotors anlegen: Roter Leitungsdraht (+), brauner Leitungsdraht (–): Laden; Brauner Leitungsdraht (+), roter Leitungsdraht (–): Entladen.

3. Prüfung/Einstellung das Bandtransportsystems

Die Bezeichnung "Bandtransportsystem" ist ein allgemeiner Ausdruck für den Weg des Magnetbandes von dem Vorratsteller über die Kopftrommel bis zu dem Aufwickelteller.

Hinweise:

1. Das Bandtransportsystem wurde werksseitig vor dem Versand eingestellt, so daß die Einstellungen nur dann durchgeführt werden sollen, wenn Komponenten des Bandlaufwerkes ausgetauscht wurden oder Einstellungen ausgedriftet sind.
2. Die Komponenten des Bandtransportsystems, und besonders die mit dem Band direkt in Kontakt kommenden Komponenten, sollten rein und ohne Beschädigung sowie ohne an den Kontaktflächen anhaftenden Staub oder Öl usw. gehalten werden.

3.1 Einstellung der Spannarmposition (Abb. 3-1)

Hinweis: Unbedingt diese Einstellung ausführen, nachdem der Spannarm, das Spannband und die Spannfeder wieder eingebaut wurden.

■Einstellpunkt
Spannbandhalter

■Vorgang

(1) Die Spannfeder an Position (b) des Hakens an dem Subchassis einhängen (siehe Abb. 3-1).
(2) Auf den Wiedergabemodus schalten, ohne eine Cassette einzusetzen (siehe Abb. 3-1).
(3) Die Schraube (A) lösen und die Position des Spannbandhalters so einstellen, daß der Zusammenhang der Position zwischen dem Spannarm und dem quadratischen Loch in dem Lademotorhalter der Abb. 3-1 entspricht.
(4) Nach dem Entladen ist das Laden auszuführen, wobei darauf zu achten ist, daß die Position des quadratischen Loches nicht geändert wurde.

Hinweis: Nach Beendigung der Einstellung, unbedingt "3.2. Prüfung/Einstellung des Spannmomentes" ausführen.

3.2 Prüfung/Einstellung des Spannmomentes (Abb. 3-1)

Hinweis: Unbedingt dieser Prüfung/Einstellung nach der Einstellung der Spannarmposition ausführen.

■Prüfeinrichtung/Vorrichtung
Cassettenband-Drehmomentmesser
(NTSC: SRK-ST-112, PAL: SRK-8T-212)

■Status des Videorecorders
Den Casttenband-Drehmomentmesser laden und auf den Wiedergabemodus schalten.

■Einstellpunkt
Spannfeder

■Vorgang

(1) Die Spannfeder an Position (b) des Hakens an dem Subchassis einhängen (siehe Abb. 3-1).
(2) Darauf achten, daß der Drehmomentmesser an der Vorratsseite ein Drehmoment von 7 bis 11 g.cm anzeigt.
Falls mehr als 11,1 g.cm angezeigt werden:
Die Spannfeder an Position (c) verstellen.
Falls weniger als 6,9 g.cm angezeigt werden:
Die Spannfeder an Position (a) verstellen.

Hinweis: Falls die Einhängpositin der Spannfeder geändert wurde, unbedingt "3.1. Einstellung der Spannarmposition" ausführen.

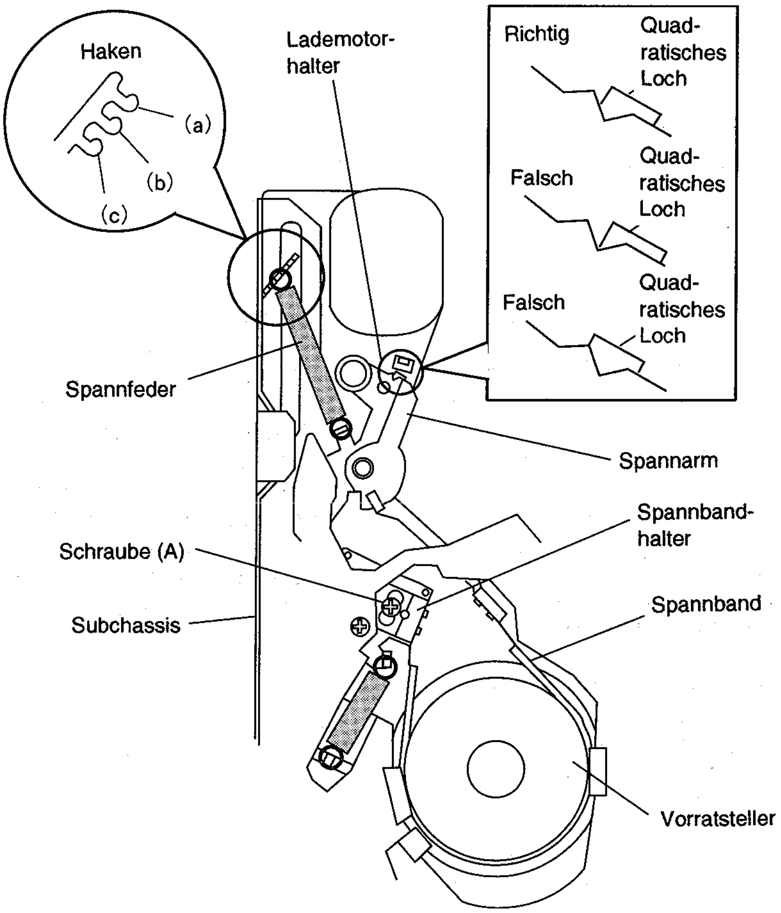

Haken
(a)
(b)
(c)
Lademotorhalter
Richtig
Quadratisches Loch
Falsch
Quadratisches Loch
Falsch
Quadratisches Loch
Spannfeder
Spannarm
Spannbandhalter
Schraube (A)
Spannband
Subchassis
Vorratsteller

Abb. 3-1

3.3 Einstellung der Kopftrommel-Grundplattenhöhe (Führungsrollenrasten) (Abb. 3-2)

Hinweis: Unbedingt diese Einstellung nach dem Wiedereinbau der Kopftrommel-Grundplatte ausführen.

■Einstellpunkt

Schrauben an der Kopftrommel-Grundplatte

■Vorgang

(1) Die beiden Schrauben an der Kopftrommel-Grundplatte (Führungsrollenrasten) drehen, so daß die vorgeschriebenen Werte erhalten werden können (siehe Abb. 3-2).

Hinweis: Nach Beendigung dieser Einstellung, unbedingt "3.5. Einstellung der Führungsrollenhöhe (Einstellung nach dem Austausch der Kopftrommel)" ausführen.

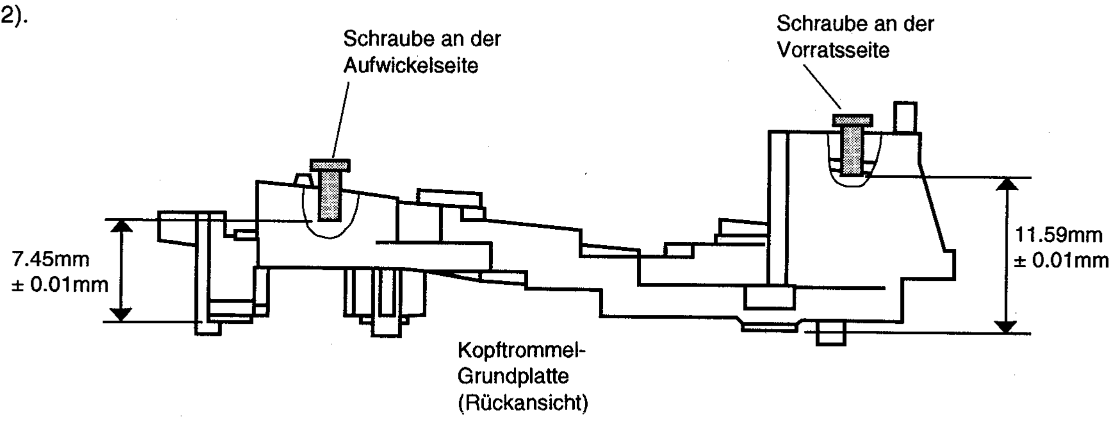

Schraube an der Aufwickelseite
Schraube an der Vorratsseite
7.45mm ± 0.01mm
11.59mm ± 0.01mm
Kopftrommel-Grundplatte (Rückansicht)

Abb. 3-2

3.4 Grobeinstellung der Führungsrollenhöhe (Abb. 3-3)

Hinweis: Unbedingt diese Einstellung nach dem Wiedereinbau der Führunsgrollen ausführen.

■Prüfeinrichtung/Vorrichtung

Spezial-Schraubendreher

■Einstellpunkt

Oberseite der Führungsrolle (I)

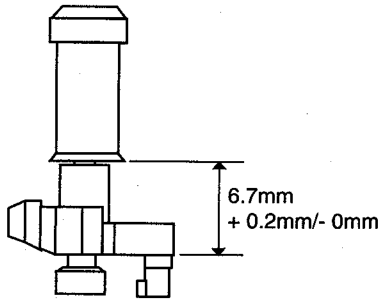
Oberseite der Führungsrolle (O)

■Vorgang

(1) Die Oberseite jeder Führungsrolle drehen, so daß die vorgeschriebenen Werte erhalten werden können (siehe Abb. 3-3).

Hinweis: Nach Beendigung dieser Einstellung, unbedingt "3.5. Einstellung der Führungsrollenhöhe (Einstellung nach dem Austausch der Kopftrommel)" ausführen.

Führungsrolle (I)
(Vorratsteller-Führungsrolle)


6.7mm
+ 0.2mm/- 0mm

Führungsrolle (O)
(Aufwickelteller-Führungsrolle)

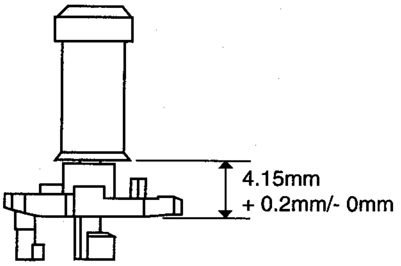

4.15mm
+ 0.2mm/- 0mm

Abb. 3-3

3.5 Einstellung der Führungsrollenhöhe (Einstellung nach dem Austausch der Kopftrommel) (Abb. 3-4, Abb. 3-5)

Hinweise:

1. Unbedingt diese Einstellung nach dem Wiedereinbau der Führungsrolle und der Kopftrommel-Grundplate ausführen. Auch darauf achten, daß vor Beginn dieser Einstellung die Einstellung des vorhergehenden Punktes beendet sein muß.
2. Nach dem Austausch der Kopftrommel, müssen auch die Einstellungen der elektrischen Schaltkreise ausgeführt werden. Siehe dazu die Wartungsanleitung jedes Modells.
3. Vor der Ausführung dieser Einstellung, die Abb. 3-5 beachten und die ATF-R Vorrichtung modifizieren.

■Prüfeinrichtung/Vorrichtung

Abgleichband
ATF-R Jig
(SW1: OFF; SW3: ON; RT1: Mechanische Mittelstellung)
Oszilloskop
Spezial-Schraubendreher

■Prüfpunkt

TP1 (SW30/25) an der ATF-R Vorrichtung
TP2 (GND) an der ATF-R Vorrichtung
TP3 (FM OUT) an der ATF-R Vorrichtung

■Einstellpunkt

Oberseite der Führungsrolle (I)
Oberseite der Führungsrolle (O)

■Vorgang

(1) Das vollständig zurückgespulte Abgleichband laden.
(2) Die Stromversorgung ausschalten.
(3) Die ATF-R Vorrichtung an die Prüfklemme der Leiterplatte anschließen.
(4) Die PLAY-Taste drücken und niederhalten; danach den POWER-Schalter auf Position VIDEO stellen.
(5) Das Oszilloskop an TP3 anschließen.
(6) Das Oszilloskop mit TP1 synchronisieren.
(7) Das Oszilloskop auf (+) Flankensteilheit einstellen.

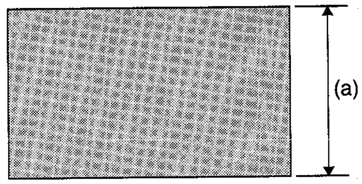
Führungsrolle (I) (Abb. 3-4)

(8) Den Schalter SW2 an der ATF-R Vorrichtung drücken und niederhalten, und danach die folgenden Schritte ausführen.
(9) Die Höhe der Führungsrolle (I) einstellen, so daß die Wellenform linear verläuft.
(10) Den Spannungspegelregler an dem Oszilloskop so einstellen, daß der Abschnitt (a) der Wellenform auf 4 Teilungen eingestellt ist.
(11) Den Schalter SW1 an der ATF-R Vorrichtung auf ON stellen.
(12) RT1 an der ATF-R Vorrichtung gegen den Uhrzeigersinn drehen, so daß die Spannung an Punkt (C) der ATF-R Vorrichtung gleich 1,8±0,1 V beträgt. Danach darauf achten, daß der Punkt (b) der Wellenform auf 3 Teilungen eingestellt ist.
(13) Die Höhe der Führungsrolle (I) so einstellen, daß die minimale Amplitude (c) der Wellenform auf mehr als 2 Teilungen eingestellt ist.

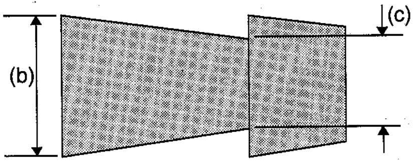
Führungsrolle (O) (Abb. 3-4)

(14) Den Schalter SW1 auf OFF stellen und RT1 an der ATF-R Vorrichtung in die mechanische Mittelstellung bringen.
(15) Das Oszilloskop auf (–) Flankensteilheit einstellen.
(16) Danach den gleichen Vorgang wie für die Führungsrolle (I) ausführen. Siehe Schritte (8) bis (13).
(17) Nach Beendigung der Einstellung der Führungsrollen (I) und (O), das Abgleichband wiederum laden und darauf achten, daß diese Einstellung zufriedenstellend ausgeführt wurde.

Hinweis: Nach Beendigung der Einstellung, unbedingt die ATF-R Vorrichtung von der Prüfklemme abtrennen und die Modifikation der ATF-R Vorrichtung wieder aufheben.

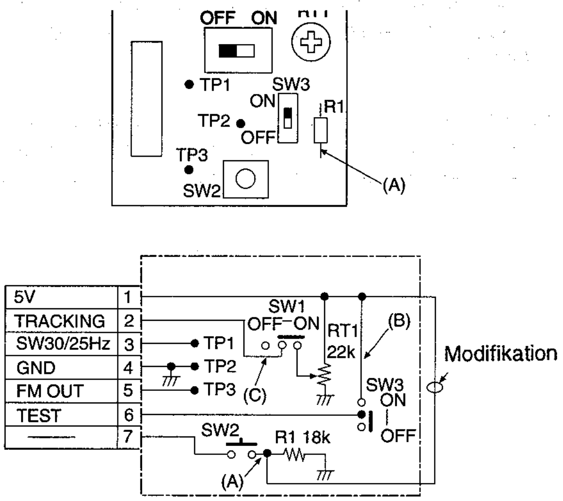


(a): 4 Teilungen



(b): 3 Teilungen
(c): Mehr als 2 Teilungen

Abb. 3-4



Modifikation: Klemme (A) des Widerstandes und Stift 1 (5 V Leitung) verbinden.

Abb. 3-5

3.6 Einstellung der Höhe des OHD-Armes (Abb. 3-6)

Hinweise:

1. Unbedingt diese Einstellung nach dem Wiedereinbau des OHD-Armes ausführen.
2. Diese Einstellung minimiert geringes Verdrehen des Bandes, das zwischen dem OHD-Arm und dem Capstanmotor aufgrund der Struktur des Bandlaufwerks auftritt.
3. Die ATF-R Vorrichtung muß nicht modifiziert werden.

■**Prüfeinrichtung/Vorrichtung**

Abgleichband
Leerband
ATF-R Vorrichtung (SW1: OFF; SW3: OFF)
Spezial-Schraubendreher
Oszilloskop
Farbmonitor

■**Prüfpunkt**

Video-Ausgang
TP1 (SW30/25) an der ATF-R Vorrichtung
TP2 (GND) an der ATF-R Vorrichtung
TP3 (FM OUT) an der ATF-R Vorrichtung

■**Status des Videorecorders**

Den Farbmonitor an den Video-Ausgang anschließen. Die ATF-R Vorrichtung an die Prüfklemme der Leiterplatte anschließen.

■**Einstellpunkt**

Oberseite des OHD-Armes

■**Vorgang**

(1) Die Stromversorgung einschalten.
(2) Ein vollständig zurückgespultes Leerband laden.
(3) Auf den Suchlauf vorwärts schalten.
(4) Das Band zwischen dem OHD-Arm und dem Capstan an einem hellen Ort genau beobachten und darauf achten, ob eine geringe Verdrehung des Bandes vorkommt. Die Farbe des Bandes (reflektiertes Bild) des verdrehten Abschnittes erscheint unterschiedlich von anderen Abschnitten. Die Verdrehung sieht auch unterschiedlich an der linken/rechten und oberen/unteren Seite aus, abhängig von dem einfallenden Licht, wie es in Abb. 3-6 dargestellt ist.
(5) Die Höhe des OHD-Arms so einstellen, daß der breiteste Abschnitt, an der die Farbe des Bandes unterschiedlich erscheint, weniger als 0,5 mm beträgt.
(6) Darauf achten, daß es am oberen oder unteren Flansch des OHD-Armes zu keiner Faltenbildung des Bandes kommt. (Wenn es jedoch zu einer geringen Faltenbildung an einem Flansch kommt, dann kann dieses im zulässigen Bereich angesehen werden, wenn keine Kratzer an dem Band verursacht werden und kein Spalt zwischen dem anderen Flansch und der Bandkante vorhanden ist.)
(7) Das wiederum zurückgespulte Leerband laden. Auf Suchlauf vorwärts und rückwärts schalten, und darauf achten, daß Schritt (6) erfüllt ist.
(8) Ein Oszilloskop an TP3 anschließen.
(9) Das Oszilloskop mit TP2 synchronisieren.
(10) Das Oszilloskop auf (+) Flankensteilheit einstellen.
(11) Das Abgleichband wiedergeben. Auf den Suchlauf vorwärts und rückwärts schalten und darauf achten, daß die FM-Wellenform nicht zusammenbricht. Auch darauf achten, daß die Rauschbalken auf dem Monitorbildschirm nicht nach oben oder unten fluktuieren.
(12) Falls Schritt (11) nicht ausgeführt werden kann, die Schraube an der Aufwickelseite der Kopftrommel-Grundplatte um etwa 45° gegen den Uhrzeigersinn drehen (siehe Abb. 3-2), und danach die Einstellung ab Beginn nochmals ausführen, nachdem "3.5. Einstellung der Führungsrollenhöhe (Einstellung nach dem Austausch der Kopftrommel)" ausgeführt wurde.

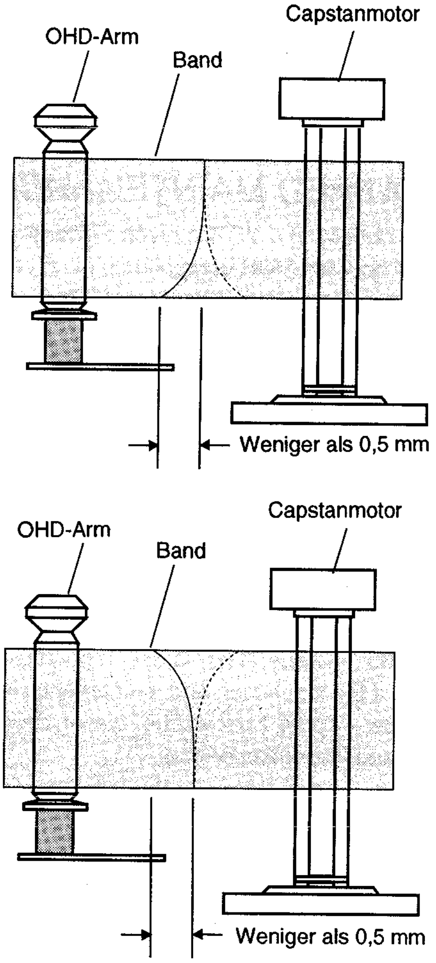


Abb. 3-6

4. Prüfung der Drehmomente

Zwei Arten von Cassetten-Drehmomentmesser stehen zur Verfügung. Verwenden Sie den geeigneten Drehmomentmesser für die jeweilige Messung.

Benennung	Videorecorder-Modus	Meßteller	Drehmoment	Verwendeter Cassetten-Drehmomentmesser
Aufwickelmoment	Wiedergabe	Aufwickelteller	10 ± 3 gcm	NTSC: SRK-8T-112 oder 132 PAL : SRK-8T-212 oder 232
Rückspulmoment	Suchlauf rückwärts	Vorratsteller	31 ± 6 gcm	NTSC: SRK-8T-132 PAL : SRK-8T-232
Aufwickelteller-Bremsmoment	Suchlauf rückwärts auf Stopp	Aufwickelteller	10 gcm oder mehr	NTSC: SRK-8T-112 oder 132 PAL : SRK-8T-212 oder 232
Bandspannmoment	Entladen	Vorratsteller	25 - 50 gcm	NTSC: SRK-8T-132 PAL : SRK-8T-232

Kapitel 3 — Wartungs/Inspektionsvorgang

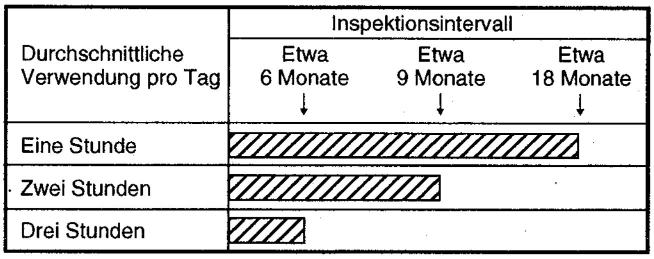
1. Erforderliche Wartung

Die Aufnahmedichte eines Videorecorders ist viel höher als die eines Tonbandgerätes. Videorecorder-Komponenten müssen sehr präzise sein, um Kompatibilität mit anderen Videorecordern sicherzustellen. Falls eine dieser Komponenten abgenutzt oder verschmutzt ist, werden die gleichen Symptome auftreten, wie bei einem defekten Teil. Um gute Bildqualität sicherzustellen, sind periodische Inspektion und Wartung erforderlich, einschließlich des Austausches von abgenutzten Teilen und Schmierung.

2. Regelmäßige Wartung

Wartung und Inspektion müssen in Abhängigkeit von der Verwendungsdauer des Videorecorders und den Umgebungsbedingungen bei der Verwendung des Videorecorders durchgeführt werden. Allgemein kann gesagt werden, daß eine gute Bildqualität sichergestellt wird, wenn Inspektion und Wartung alle 500 Betriebsstunden durchgeführt werden. Tabelle 1 zeigt den Zusammenhang zwischen der Verwendungszeit pro Tag und den Inspektionsintervallen.

Tabelle 1



3. Prüfung vor Beginn von Reparaturen

Die im Wiedergabebild auftretenden Fehler, wie in Tabelle 2 aufgeführt, können durch Reinigen und Ölen behoben werden. Die Notwendigkeit einer Schmierung und die Bedingungen hinsichtlich der Sauberkeit der Einheit prüfen. Den Kunden über die Verwendungshäufigkeit befragen. Falls Sie anhand dieser Informationen eine Inspektion und Wartung der Einheit erforderlich halten, die in Tabelle 2 aufgeführten Teile prüfen.

Tabelle 2

Phänomen	Inspektionspunkt
Schlechter Signal-Rauschspannungsabstand, keine Farbe	Schmutz am Videokopf oder abgenutzter Videokopf
Band läuft nicht oder bildet Schleifen	Schmutz an der Andruckrolle, Kopftrommel oder im Bandlaufwerk
Vertikaler Jitter	Schmutz auf dem Videokopf oder in dem Bandtransportsystem
Niedrige Lautstärke oder verzerrter Ton	Schmutz am Videokopf oder abgenutzter Videokopf

4. Für Inspektion und Wartung erforderliche Werkzeuge

(1) Kopfreinigungssatz
(2) Videorecorder-Öl und -Fett (Tabelle 3)
(3) Alkohol
(4) Watte
(5) Reinigungsband (Maxell 8M-CL MCA (Trockentyp))

Tabelle 3 Schmierpunkte (Fett oder Öl)

Schmiermittel	Schmierpunkt (Öl oder Fett)
Sonic Slidas Oil (#1600)	Langsam rotierende Abschnitte ölen
Froil (G31-SAY)	Metall- oder Kunststoffteile unter geringer Last schmieren
Molicoat (PG-641)	Metall- oder Kunststoffteile unter geringer Last schmieren
Sicherungslack	Einstellschrauben fixieren

5. Wartungsvorgang

5-1 Reinigen

5-1-1 Reinigen des Videokopfes

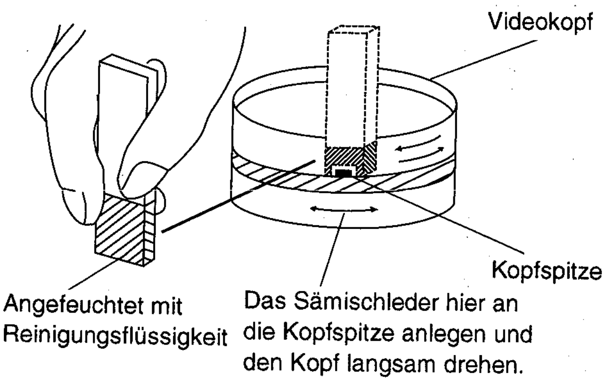
Zuerst ein Reinigungsband verwenden. Unbedingt das vorgeschriebene Reinigungsband verwenden und die damit mitgelieferte Anleitung vor der Verwendung aufmerksam durchlesen. Falls der Schmutz mit Hilfe des Reinigungsbandes nicht von dem Kopf entfernt werden kann, den Reinigungsatz verwenden. Ein Reinigungsstäbchen an dem gezeigten Punkt mit Reinigungsflüssigkeit anfeuchten. Das Reinigungsstäbchen an der Kopfspitze anlegen und den Kopf (Kopftrommel) vorsichtig nach rechts und links drehen. (Das Reinigungsstäbchen nicht vertikal bewegen und darauf achten, daß nur das Sämischleder des Stäbchens in Kontakt mit dem Kopf kommt. Anderenfalls könnte der Kopf beschädigt werden.) Den Kopf gründlich trocknen. Danach ein Band zur Probe abspielen. Falls Reinigungsflüssigkeit auf dem Videokopf verbleibt, könnte das Band beschädigt werden, wenn es in Kontakt mit der Kopffläche kommt.

5-1-2 Reinigen des Bandtransportsystems, Antriebssystems usw.

Mit in Alkohol angefeuchteter Watte abwischen.

Hinweise:

1. Das Bandtransportsystem ist das System, das in Kontakt mit dem laufenden Band kommt. Das Antriebssystem besteht aus den Teilen, die das Band antreiben.
2. Darauf achten, daß während des Reinigens das Bandtransportsystem nicht mit der Spitze eines Schraubendrehers berührt und das System keinen zu starken Kräften ausgesetzt wird, die das System verformen können.


Videokopf
Kopfspitze
Angefeuchtet mit Reinigungsflüssigkeit
Das Sämischleder hier an die Kopfspitze anlegen und den Kopf langsam drehen.

5-2 Schmierung

5-2-1 Richtlinien für die Ölschmierung

Den Öler verwenden, um ein oder zwei Tropfen Sonic Slidas Öl aufzutragen. Darauf achten, daß nicht zu viel Öl aufgetragen wird, da dieses auf drehende Teile gelangen und Schlupf sowie andere Probleme verursachen kann. Falls zu viel Öl aufgetragen wurde, dieses mit Alkohol abwischen.

5-2-2 Periodische Schmierung

Die vorgeschriebenen Punkte nur schmieren, wenn Komponenten ausgetauscht wurden. Für die Schmierpunkte siehe die Explosionszeichnungen.

5-3 Fettschmierung

5-3-1 Richtlinien für die Fettschmierung

Froil oder Molicoat Fett mit einem Stäbchen oder einem Pinsel auftragen. Nicht zu viel Fett verwenden. Es könnte mit dem Bandtransport oder dem Antriebssystem in Kontakt kommen. Überschüssiges Fett abwischen und mit in Alkohol angefeuchter Watte reinigen.

5-3-2 Periodische Schmierung

Fett nur auf den vorgeschriebenen Punkten auftragen, wenn Komponenten ausgetauscht wurden. Für die Punkte, auf welchen Fett aufgetragen werden soll, siehe die Explosionszeichnungen.

Tabelle 4 Zu wartende/prüfende Teile und Wartungs/Prüfungsplan

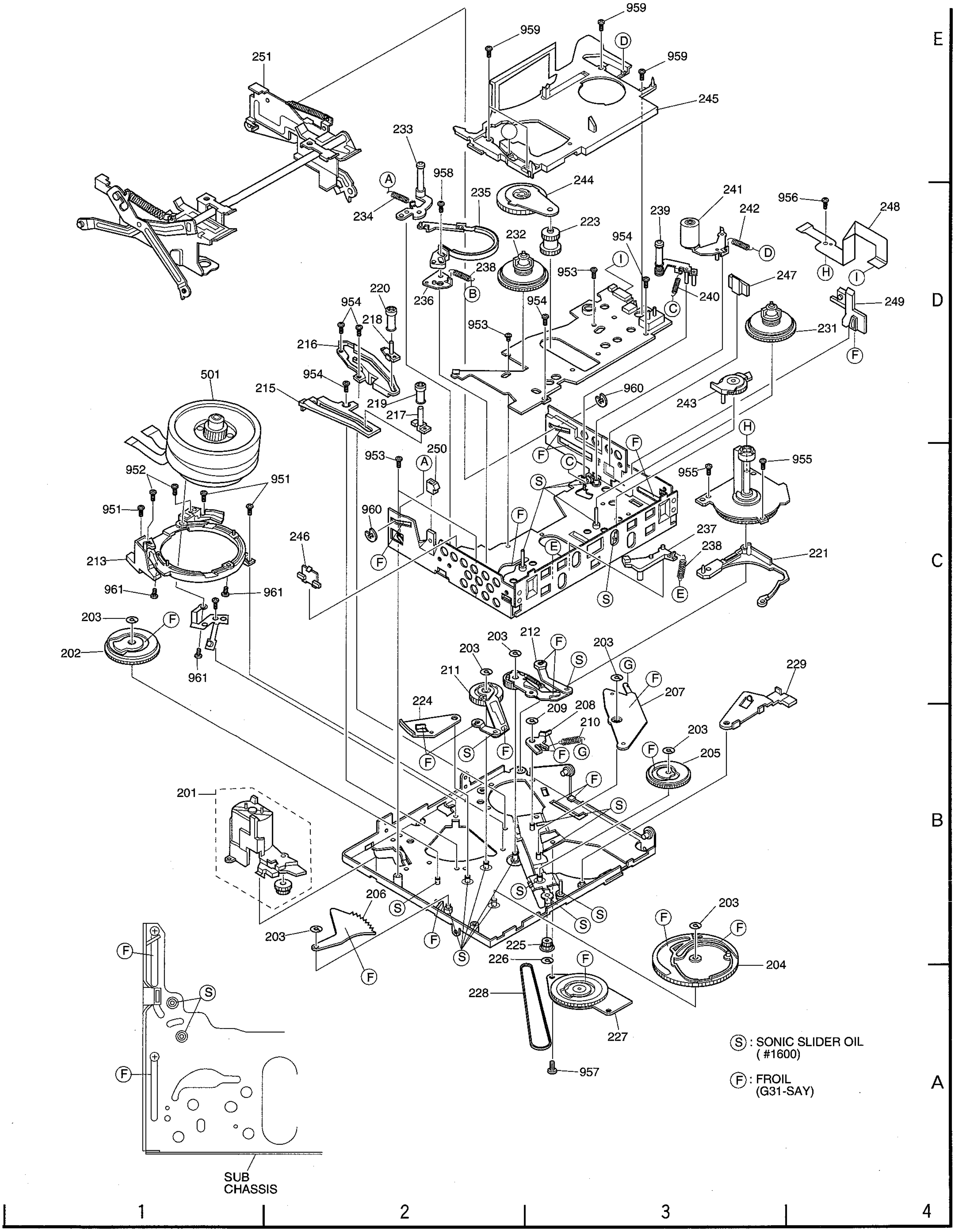
Vorsicht: Die folgende Tabelle betrifft nicht alle Einheiten. Der Wartungs/Prüfungsplan hängt von der Verwendung der Einheit und den Umgebungsbedingungen ab.

Stunden / Komponente	500	1000	1500	2000	2500	3000
Kopftrommel (Videoköpfe)	R	R / A	R	R / A	R	R / A
Führungsrolle (I)	R	R	R	R	R	R
Aufwickelteller-Führungsrolle (O)	R	R	R	R	R	R
OHD-Arm	R	R	R	R	R	R
Spannarm	R	R	R	R	R	R
Spannband		A		A		A
Vorratsteller	R	R	R	R	R	R
Aufwickelteller	R	R	R	R	R	R
Andruckarm	R	R	R	R / A	R	R
Steuerriemen				A		
Zwischenrad				A		
Capstanmotor (Welle)	R	R	R	R / A	R	R
Lademotor				A		

R: Reinigen
A: Austauschen des Teils

CHAPTER 4 EXPLODED VIEW

MECHANISM


959
959
959
Ⓓ
251
245
233
Ⓐ
958
244
235
241
956
248
234
223
239
242
Ⓓ
232
954
953
Ⓘ
238
Ⓑ
247
Ⓗ
Ⓘ
236
240
Ⓒ
220
954
954
218
953
249
231
Ⓕ
216
501
954
215
960
243
219
217
Ⓗ
250
Ⓐ
953
Ⓕ
Ⓕ
Ⓒ
955
955
952
951
Ⓢ
951
960
Ⓕ
246
237
Ⓔ
238
213
221
Ⓕ
Ⓢ
Ⓔ
961
961
203
Ⓕ
202
961
203
212
Ⓕ
203
Ⓢ
203
Ⓖ
229
211
Ⓕ
207
224
209
208
210
203
Ⓢ
Ⓕ
Ⓕ
Ⓖ
Ⓕ
205
Ⓕ
201
Ⓢ
Ⓢ
206
Ⓢ
203
Ⓢ
Ⓢ
Ⓕ
Ⓕ
203
Ⓕ
Ⓢ
225
226
Ⓕ
Ⓕ
204
Ⓢ
228
227
957
Ⓕ
SUB CHASSIS
E
D
C
B
A
1
2
3
4

Ⓢ : SONIC SLIDER OIL
(#1600)

Ⓕ : FROIL
(G31-SAY)

HITACHI

SERVICE MANUAL
Wartungsanleitung

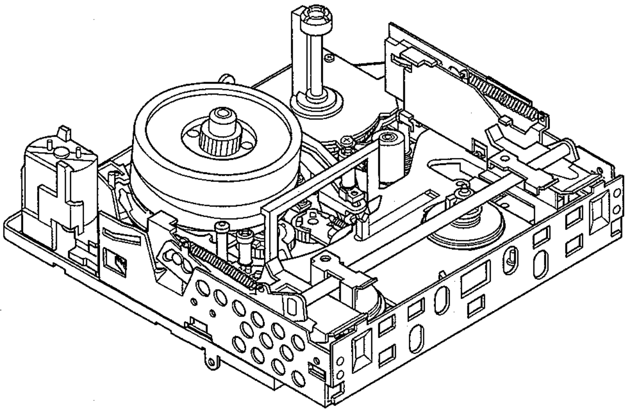
TK | No. 6811E,G-1

UH MECHANISM

SUPPLEMENT

ERGÄNZUNG

125583



Mechanical Adjustment

Mechanische Einstellungen

"Mechanical Adjustment" in the UH MECHANISM Service Manual (No. 6811E,G) has been revised.
Refer to this manual, in place of the previous "Mechanical Adjustment".

Die "Mechanischen Einstellungen" in der Wartungsanleitung für das UH-Laufwerk (Nr. 6811E,G) wurde revidiert.
Verwenden Sie die vorliegende Anleitung anstelle der früheren "Mechanischen Einstellungen".

8

Hi8

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT
Änderungen der Technischen Daten und Teile im Sinne ständiger Verbesserung vorbehalten

8mm VIDEO CAMERA/RECORDER
8-mm-Video-Kamerarecorder

January 2000 Digital Media Products Division,Tokai

CONTENTS

CHAPTER 2 MECHANICAL ADJUSTMENT

1. ADJUSTMENT POINTS ON THE MECHANISM ········ E1
2. BEFORE STARTING ADJUSTMENT ························· E1
3. TAPE TRANSPORT SYSTEM CHECK/ADJUSTMENT ··· E1
    3.1 Tension Arm Position and Tension Torque Check ··· E2
    3.2 Tension Arm Position and Tension Torque Adjustment ·· E2
    3.3 Coarse Adjustment of Guide Roller (O) and Guide (I) Heights ·························· E3
    3.4 Guide Roller (O) and Guide (I) Heights (Adjustment After Replacing Cylinder) ················ E4
    3.5 OHD Arm Height Adjustment ····························· E5
4. CHECK THE TORQUE ··· E6

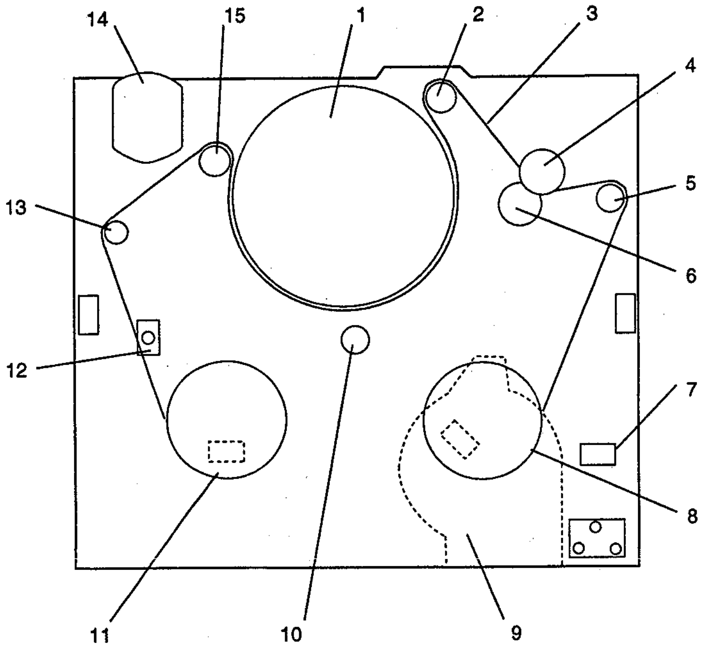
For Torque Value

Torque values are indicated in conventional units in this manual, along with SI units in brackets [ ].

Note: SI stands for Le Système international d'unités in French, which is an internationally unified measurement unit system.

CHAPTER 2 MECHANICAL ADJUSTMENT

1. ADJUSTMENT POINTS ON THE MECHANISM



1. Cylinder
2. Guide Roller (O) [Take-up Guide Roller]
3. Tape
4. Capstan Motor
5. OHD Arm [Pull Out Arm]
6. Pressure Arm [Pressure Roller]
7. Cassette Holder Switch
8. Take-up Reel Disk
9. Mode Switch [Mechanism State Switch]
10. End LED
11. Supply Reel Disk
12. Tension Band Holder
13. Tension Arm [Tension Pole]
14. Loading Motor
15. Guide (I) [Supply Guide]

Fig. 1-1

2. BEFORE STARTING ADJUSTMENT

(1) See "CHAPTER 1 DISASSEMBLY" for dismantling and reassembling the mechanism, and matching phases of gears in assembly.

(2) The following describes the procedure for setting the mechanism to the playback mode without inserting a cassette (a circuit board that mounts mechanism drive circuits must be connected):
The playback mode cannot be kept by any of the following procedures because reel disks do not turn, etc.:

   1) Set the mechanism to the unloading stop or eject mode.
   2) Shade light from the end LEDs.
   3) Lower the cassette holder.
   4) Press the playback button.

(3) The following shows the procedure for loading and unloading the unassembled mechanism:

   1) Supply 4V DC to the terminals of loading motor:
   Red lead wire (+), brown lead wire (-): Loading
   Brown lead wire (+), red lead wire (-): Unloading

3. TAPE TRANSPORT SYSTEM CHECK/ADJUSTMENT

The tape transport system is a generic term for the path from the supply reel disk to the take-up reel disk via cylinder.

Notes:
1. The tape transport system is adjusted before shipment from the factory, so perform adjustments only when components of the transport system are replaced or adjustments of the transport system have drafted.
2. The tape transport components, especially the components which come into direct contact with the tape, should be kept clean without damage, dust or oil, etc. adhering to the contact surfaces.

3.1 Tension Arm Position and Tension Torque Check (Fig. 3-1)

Notes: 1. This item is an operation check for periodic maintenance. Check the following, and only when adjustment is necessary, proceed with adjustment in next item.

2. Adjustment is unconditionally necessary after replacing the tension arm, tension band or tension arm spring. Proceed with adjustment in next item.

■ Test Equipment/Jig

Cassette Torque Meter (SRK-8T-112 or 212)

■ Procedure

(1) Make sure that the tension arm spring is hooked onto hook (b) on the subchassis. (Fig. 3-1)

(2) Set the camcorder to the playback mode without inserting a cassette. (See the previous page.)

[Check item 1]

(3) After setting to the rewind mode, set the camcorder to the playback mode. Make sure that the tension arm moves in the direction of arrow (B).

[Check item 2]

(4) Insert the cassette torque meter, set to the playback mode, and make sure that the value on the supply side is 8-10 g-cm [0.00078-0.00098 N·m].

(5) Proceed with adjustment in next item only when the check items are not satisfied.

3.2 Tension Arm Position and Tension Torque Adjustment (Fig. 3-1, 3-2)

Notes: 1. Be sure to perform this adjustment after replacing the tension arm, tension band or tension arm spring. When the tension arm or tension spring must be replaced, also replace the tension band.

2. Be sure to replace the tension band before performing this adjustment.

■ Test Equipment/Jig

Cassette Torque Meter (SRK-8T-112 or 212)

■ Adjustment Point

Band Bracket (B)

■ Procedure

(1) Attach all parts. Loosen screw (E).

(2) Hook the tension arm spring onto hook (b) on the subchassis. (Fig. 3-1)

(3) Set the camcorder to the playback mode without inserting a cassette. (See the previous page.)

(4) Make sure that the tension arm fully moves in the direction of arrow (A).

(5) Check the position relationship between the tension arm and the square hole in the loading motor holder (initial position). [Fig. 3-2 (initial position)]

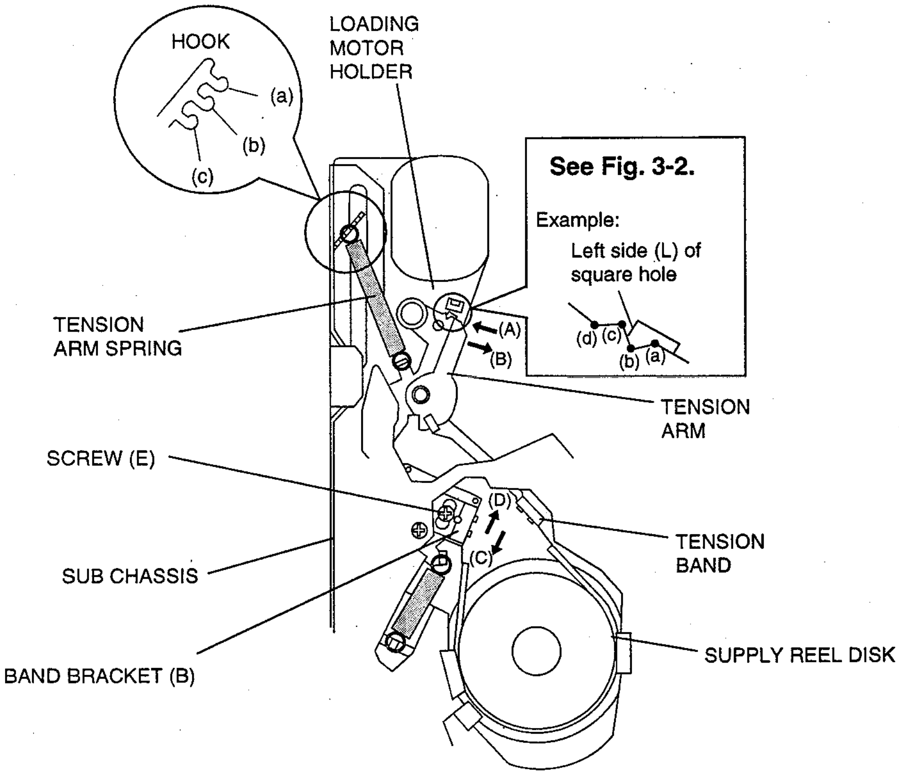


Fig. 3-1

(6) Adjust the position of band bracket B according to the initial position so that the relationship between the tension arm and the square hole in the loading motor holder is as shown in Fig. 3-2 (adjustment position).

(7) Tighten screw (E) to temporarily fix band bracket B so that it does not move.

[Check item 1]

(8) After setting to the rewind mode, set the camcorder to the playback mode. Make sure that the tension arm moves in the direction of arrow (B).

[Check item 2]

(9) Insert the cassette torque meter, set to the playback mode, and make sure that the value on the supply side is 8-10 g-cm [0.00078-0.00098 N·m].

(10) If both two check items are satisfied, remove the cassette torque meter, and additionally tighten screw (E), taking care that band bracket B does not move, to complete adjustment.

Note: If both or either check item is not satisfied, proceed with the following adjustment (countermeasures):

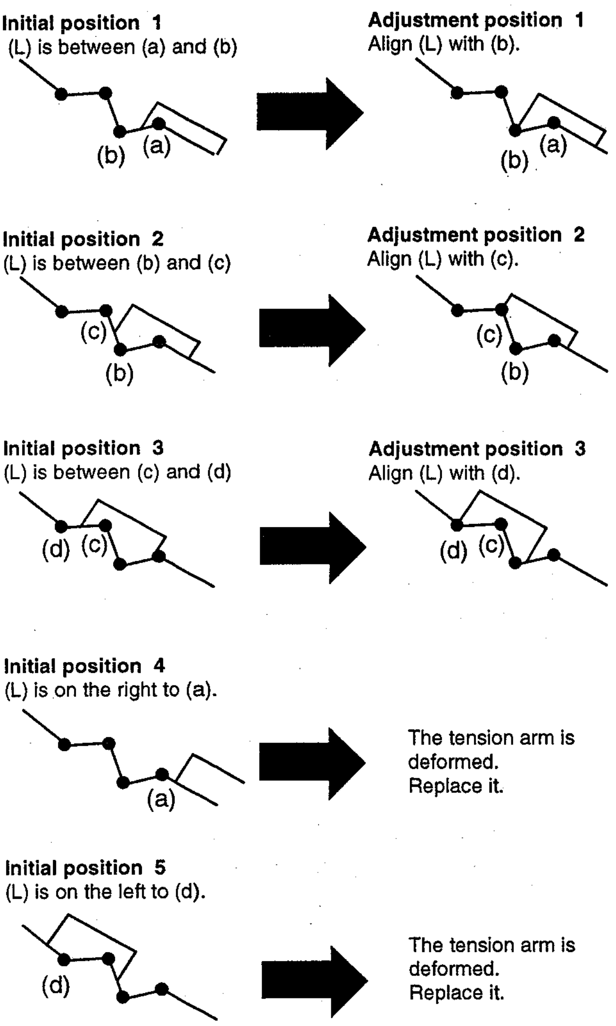

Initial position 1
(L) is between (a) and (b)
(b)
(a)
Adjustment position 1
Align (L) with (b).
(b)
(a)
Initial position 2
(L) is between (b) and (c)
(c)
(b)
Adjustment position 2
Align (L) with (c).
(c)
(b)
Initial position 3
(L) is between (c) and (d)
(d)
(c)
Adjustment position 3
Align (L) with (d).
(d)
(c)
Initial position 4
(L) is on the right to (a).
(a)
The tension arm is deformed. Replace it.
Initial position 5
(L) is on the left to (d).
(d)
The tension arm is deformed. Replace it.

Fig. 3-2

When only check item 1 is faulty:
Fine adjust the position of band bracket B in the direction of arrow (D). Make sure of check items 1 and 2 again.

When only check item 2 is faulty:
If the torque is higher than the specified value, fine adjust the position of band bracket B in the direction of arrow (C), and then make sure of check items 1 and 2 again.

When both check items 1 and 2 are faulty:
If the torque is lower than the specified value, fine adjust the position of band bracket B in the direction of arrow (D), and then make sure of check items 1 and 2 again.

Notes: 1. If both check items 1 and 2 are not satisfied after the above countermeasures, check the tension band and tension arm spring, and if necessary, replace either or both.
2. Do not change the hooking position of the tension arm spring.

3.3 Coarse Adjustment of Guide Roller (O) and Guide (I) Heights (Fig. 3-3)

Note: Be sure to perform this adjustment after replacing the O guide roller or I guide.

■ **Test Equipment/Jig**
Sepcial Driver

■ **Adjustment Point**
Top of the Guide (I)
Top of the Guide Roller (O)

■ **Procedure**

(1) Screw in the guide roller (O) or guide (I) into each base, make surface (A) of guide roller (guide) in contact with surface (B) of base, and then loosen the guide roller (O) or guide (I) by approx. 360°.

Note: After this adjustment is completed, be sure to perform "3.4 Adjustment of Guide Roller (O) and Guide (I) Heights (Adjustment After Replacing Cylinder)".

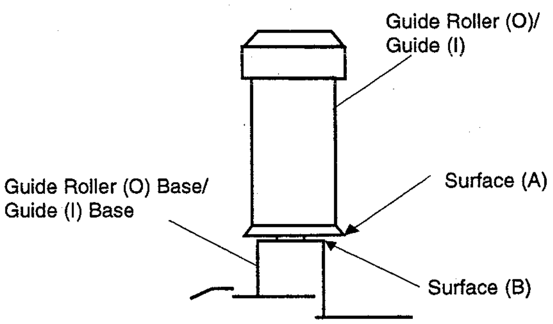

Guide Roller (O)/
Guide (I)
Guide Roller (O) Base/
Guide (I) Base
Surface (A)
Surface (B)

Fig. 3-3

3.4 Guide Roller (O) and Guide (I) Heights Adjustment (Adjustment After Replacing Cylinder) (Fig. 3-4 - 3-6)

Notes:
1. Be sure to perform this adjustment after replacing the guide roller (O), guide (I) or cylinder base. After replacing the guide roller (O) or guide (I), perform the coarse adjustment in the previous item in advance.
2. When the cylinder is replaced, the electric circuit adjustment is also necessary. See the service manual of this model and also perform electrical circuit adjustment.
3. Before starting adjustment, modify the ATF-R jig, referring to Fig. 3-6.

■ **Test Equipment/Jig**

Alignment Tape
ATF-R Jig
Oscilloscope
Special Driver

■ **Test Point**

TP1 (SW30/25) on ATF-R jig
TP2 (GND) on ATF-R jig
TP3 (FM OUT) on ATF-R jig

■ **Adjustment Point**

Top of the Guide (I)
Top of the Guide Roller (O)

■ **Procedure**

(1) Insert the alignment tape which has been completely rewound, and set the camcorder to the test mode by the following procedure.

[To set to the test mode]
1) Remove the power supply (adapter, battery, etc.).
2) Set the power switch to the VCR position.
3) Connect the ATF-R jig to the test terminal (test connector), supply power again with the playback button held down.

Notes:
1. If the mechanism operates (enters the playback mode) when power is supplied, it indicates that the camcorder has not been set to the test mode. Start from item 1) over.
2. The test mode is released when the power supply is removed.

(2) Connect an oscilloscope to TP3 and press the playback button.
(3) Synchronize the oscilloscope with TP1 (SW30/25).
(4) Set the oscilloscope probe to (+).

Guide (I) (Fig. 3-4)

(5) Holding down SW2 on the ATF-R jig, perform the following steps.
(6) Adjust the height of guide (I) so that the waveform is flat.
(7) Adjust the voltage control on the oscilloscope so that amplitude (a) of the waveform is set to 4 graduations.
(8) Set SW1 on the ATF-R jig to ON.
(9) Turn RT1 on the ATF-R jig, and make sure that the waveform changes while it is flat. If this cannot be confirmed, fine adjust the height of guide (I), to satisfy the condition.

Guide Roller (O) (Fig. 3-5)

(10) Set SW1 on the ATF-R jig to OFF.
(11) Set the oscilloscope probe to (-).
(12) Adjust the voltage control on the oscilloscope so that amplitude (b) of the waveform is set to 4 graduations.
(13) Turn RT1 on the ATF-R jig counterclockwise so that the voltage at section (C) (pin 2) on the ATF-R jig is 1.1 ± 0.1 V. Make sure that amplitude (b) of the waveform is set to 3 graduations.
(14) Adjust the height of guide roller (O) so that minimum amplitude (c) of the waveform is set to 2 ± 0.3 graduations.
(15) After adjusting the heights of guide (I) and guide roller (O), reinsert the alignment tape, and make sure that the contents of this adjustment are satisfied.

Note: After adjustment is completed, perform the following:
1) Remove the ATF-R jig from the test terminal (test connector), and release its modification.
2) Remove the power supply to release the test mode.
3) Make sure of adjustment items in step (7) and after of "3.5 OHD Arm Height Adjustment".

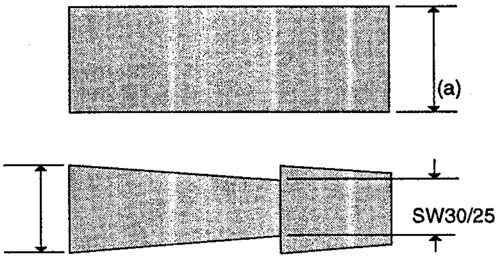


Fig.3-4

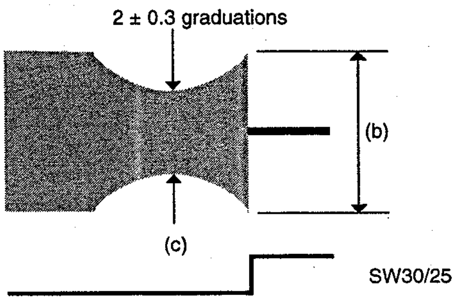
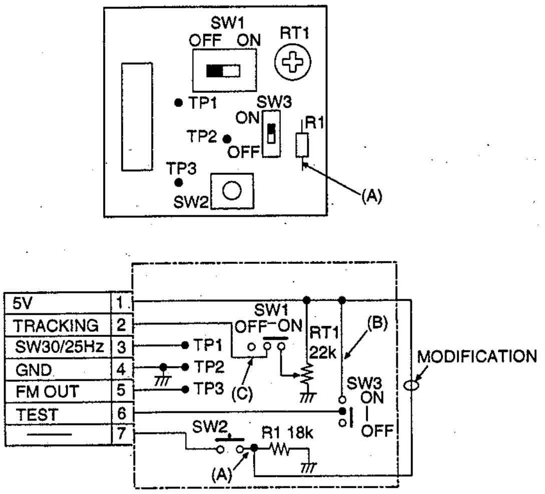


Fig.3-5



Modification: Connect terminal (A) of the resistor and pin 1 (5V).

Fig. 3-6

3.5 OHD Arm Height Adjustment (Fig. 3-7)

Notes:
1. Be sure to perform this adjustment after reinstalling the OHD arm.
2. After the heights of O guide roller/I guide are adjusted or the capstan motor is replaced, make sure of adjustment items in step (7) and after.
   If the contents are not satisfied, perform this adjustment from step (1).
3. This adjustment minimizes minute twisting of tape that occurs between the OHD arm and capstan motor due to the structure of mechanism.
4. It is not necessary to modify the ATF-R jig.

■ Test Equipment/Jig

Alignments Tape
Blank Tape
ATF-R Jig (SW1: OFF, SW3: OFF)
Special Driver
Oscilloscope
Color Monitor TV

■ Test Point

Video Out
TP1 (SW30/25) on ATF-R jig
TP2 (GND) on ATF-R jig
TP3 (FM OUT) on ATF-R jig

■ State of VCR

Connect the color monitor TV to video out.
Connect the ATF-R jig to the test terminal on the circuit board.

■ Adjustment Point

Top of the OHD Arm

■ Procedure

(1) Turn power on.
(2) Load a blank tape that has been completely rewound.
(3) Set to the forward search mode.
(4) Carefully observe the tape between the OHD arm and capstan in a bright place, and make sure that minute twisting occurs on the tape. The color of tape (reflected image) at the twisted portion will appear different from the other portions. Also, twisting will look different on the left/right and up/down depending on the direction of incident light, as shown in Fig. 3-7.
(5) Adjust the height of OHD arm so that the widest portion where color of tape looks different is less than 0.5 mm.
(6) Make sure that no curling of tape occurs at either the top or the bottom flange of OHD arm. (However, even if some curling occurs at either flange, it can be judged in the allowable range if there is no scratch on the tape and there is no gap between the other flange and tape edge.)
(7) Load the blank tape that has been rewound again. Set to the forward and reverse search modes, and make sure that step (6) is satisfied.
(8) Connect an oscilloscope to TP3.
(9) Synchronize the oscilloscope with TP1.
(10) Set the oscilloscope to (+) slope.
(11) Play back the alignment tape. Set to forward search and reverse search modes, and make sure that the FM waveform does not collapse.
Also, make sure that noise bars do not fluctuate up and down on the monitor screen.
(12) If step (11) is not satisfied, it indicates that the OHD arm is abnormal (deformed). Replace the OHD arm.

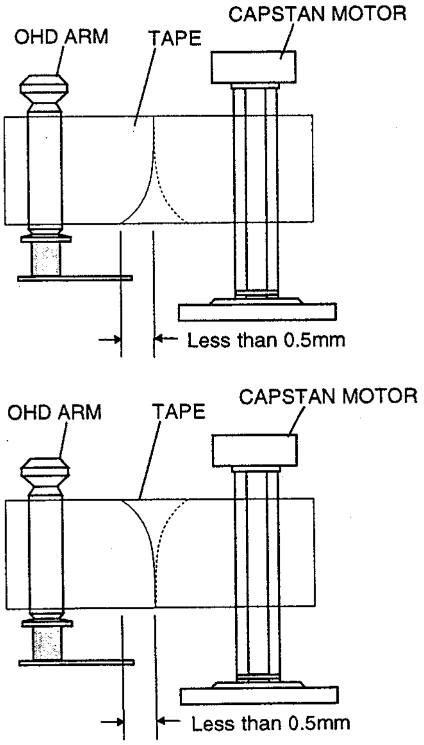


Fig. 3-7

4. CHECK THE TORQUE

There are two types of cassette torque meter.
Choose the applicable one for the measurement to be performed.

Item	VCR Mode	Measured Reel Disk	Torque Value	Torque Cassette Used
Take-up Torque	Playback	Take-up	10 ± 3 g-cm [0.00098 ± 0.00029 N·m]	NTSC: SRK-8T-112 or 132 PAL: SRK-8T-212 or 232
Rewind Torque	Reverse Search	Supply	24 ± 6 g-cm [0.00235 ± 0.00059 N·m]	NTSC: SRK-8T-132 PAL: SRK-8T-232
Take-up Brake Torque	Reverse Search to Stop	Take-up	10g-cm or more [0.00098 N·m or more]	NTSC: SRK-8T-112 or 132 PAL: SRK-8T-212 or 232
Slack Removal Torque	Unloading	Supply	25-50 g-cm [0.00245-0.0049 N·m]	NTSC: SRK-8T-132 PAL: SRK-8T-232

For Torque Value

Torque values are indicated in conventional units in this manual, along with SI units in brackets [ ].

Note:SI stands for Le Système international d'unités in French, which is an internationally unified measurement unit system.

INHALT

Kapitel 2 | Mechanische Einstellung

1. Einstellpunkte des Bandlaufwerks .... G - 1
2. Vor Beginn der Einstellung .... G - 1
3. Prüfung/Einstellung das Bandtransportsystems ..... G - 1
    3.1 Kontrolle der Spannarmposition und des Spannmoments .... G - 2
    3.2 Einstellung der Spannarmposition und des Spannmoments .... G - 2
    3.3 Grobeinstellung der Führungsrollen- (O) und Führungshöhen (I) .... G - 3
    3.4 Einstellung der Führungsrollen- (O) und Führungshöhen (I) (Einstellung nach dem Austausch der Kopftrommel) .... G - 4
    3.5 Einstellung der Höhe des OHD-Armes .... G - 5
4. Prüfung der Drehmomente .... G - 6

Drehmomentwerte

Die Drehmomentwerte werden in dieser Anleitung in konventionellen Einheiten gemeinsam mit den in Klammern [ ] gestellten SI-Einheiten angegeben.

Hinweis: SI steht für "Le Système international d'unités" in Französisch, womit ein international normiertes System der Maßeinheiten bezeichnet wird.

Kapitel 2 Mechanische Einstellung

1. Einstellpunkte des Bandlaufwerks

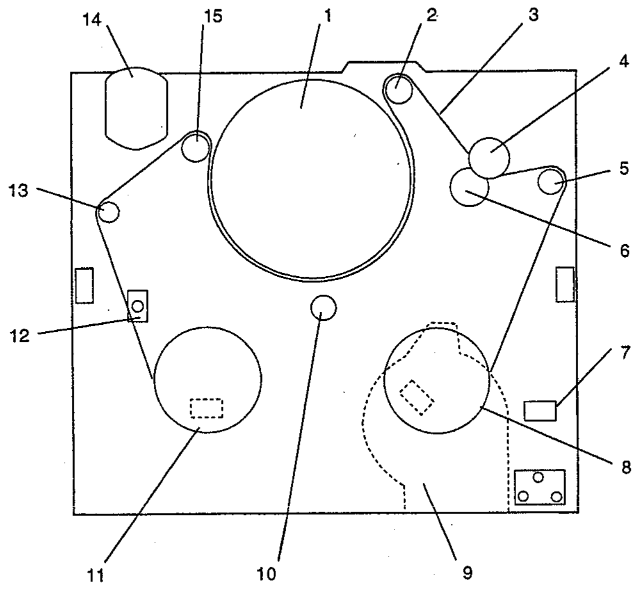


Abb. 1-1

1. Kopftrommel
2. Führungsrolle (O) (Aufwickelteller-Führungsrolle)
3. Band
4. Capstanmotor
5. OHD-Arm (Auszieharm)
6. Andruckarm (Andruckrolle)
7. Cassettenhalterschalter
8. Aufwickelteller
9. Modusschalter (Bandlaufwerk-Statusschalter)
10. Ende-LED
11. Vorratsteller
12. Spannbandhalter
13. Spannarm (Spannstift)
14. Lademotor
15. **Führungsrolle (I) (Vorratsteller)**

2. Vor Beginn der Einstellung

(1) Für die Demontage und den Wiederzusammenbau des Bandlaufwerkes sowie für die Phasenanpassung der Zahnräder siehe "Kapitel 2 Demontage".

(2) Nachfolgend ist die Methode beschrieben, wie das Bandlaufwerk auf den Wiedergabemodus geschaltet werden kann, ohne eine Cassette einzusetzen (eine Leiterplatte mit den Bandlaufwerk-Schaltkreisen muß angeschlossen werden):
Der Wiedergabemodus kann durch keinen der folgenden Vorgänge aufrecht erhalten werden, da der Wickelteller nicht dreht usw.:
  1) Das Bandlaufwerk auf den Entladestopp- oder Auswurfmodus stellen.
  2) Das Licht von den Ende-LEDs abdecken.
  3) Den Cassettenhalter absenken.
  4) Die Wiedergabetaste drücken.

(3) Nachfolgend ist der Vorgang für das Laden und Entladen eines demontierten Bandlaufwerkes beschrieben:
  1) Eine Gleichspannung von 4 V an die Klemmen des Lademotors anlegen: Roter Leitungsdraht (+), brauner Leitungsdraht (–): Laden; Brauner Leitungsdraht (+), roter Leitungsdraht (–): Entladen.

3. Prüfung/Einstellung das Bandtransportsystems

Die Bezeichnung "Bandtransportsystem" ist ein allgemeiner Ausdruck für den Weg des Magnetbandes von dem Vorratsteller über die Kopftrommel bis zu dem Aufwickelteller.

Hinweise:

1. Das Bandtransportsystem wurde werksseitig vor dem Versand eingestellt, so daß die Einstellungen nur dann durchgeführt werden sollen, wenn Komponenten des Bandlaufwerkes ausgetauscht wurden oder Einstellungen ausgedriftet sind.
2. Die Komponenten des Bandtransportsystems, und besonders die mit dem Band direkt in Kontakt kommenden Komponenten, sollten rein und ohne Beschädigung sowie ohne an den Kontaktflächen anhaftenden Staub oder Öl usw. gehalten werden.

3.1 Kontrolle der Spannarmposition und des Spannmoments (Abb. 3-1)

Hinweise:

1. Dieser Punkt entspricht einer Betriebsprüfung für die periodische Wartung. Die folgenden Punkte kontrollieren, und nur wenn eine Einstellung erforderlich ist mit der Einstellung des nächsten Punktes fortsetzen.
2. Die Einstellung ist unter allen Bedingungen erforderlich, nachdem der Spannarm, das Spannband oder die Spannarmfeder ausgetauscht wurde. Setzen Sie mit der Einstellung in dem nächsten Punkt fort.

■Prüfausrüstung/Vorrichtung

Cassetten-Drehmomentmesser (SRK-8T-112 oder 212)

■Vorgang

(1) Darauf achten, daß die Spannarmfeder an dem Haken (b) in dem Hilfschassis eingehängt ist (Abb. 3-1).

(2) Den Video-Kamerarecorder auf den Wiedergabemodus schalten, ohne eine Cassette einzulegen (siehe vorhergehende Seite).

[Prüfpunkt 1]

(3) Nachdem auf den Rücklaufmodus geschaltet wurde, den Video-Kamerarecorder auf den Wiedergabemodus schalten. Darauf achten, daß der Spannarm in die Richtung des Pfeiles (B) bewegt wird.

[Prüfpunkt 2]

(4) Den Cassetten-Drehzahlmesser einsetzen, auf den Wiedergabemodus schalten und darauf achten, daß der Wert an der Vorratsseite 8 - 10 g.cm [0,00078 - 0,00098 N•m] beträgt.

(5) Nur dann mit der Einstellung des nächsten Punktes fortsetzen, wenn die Prüfpunkte nicht erfüllt sind.

3.2 Einstellung der Spannarmposition und des Spannmoments (Abb. 3-1, Abb. 3-2)

Hinweise:

1. Diese Einstellung unbedingt nach dem Austauschen des Spannarms, des Spannbandes oder der Spannarmfeder ausführen. Wenn der Spannarm oder die Spannfeder ausgetauscht werden muß, auch das Spannband erneuern.
2. Unbedingt das Spannband erneuern, bevor diese Einstellung ausgeführt wird.

■Prüfausrüstung/Vorrichtung

Cassetten-Drehzahlmesser (SRK-8T-112 oder 212)

■Einstellpunkt

Bandhalterung (B)

■Vorgang

(1) Alle Teile anbringen. Die Schraube (E) lösen.

(2) Die Spannarmfeder an dem Haken (b) des Hilfschassis einhängen (Abb. 3-1).

(3) Den Video-Kamerarecorder auf den Wiedergabemodus schalten, ohne eine Cassette einzusetzen (siehe vorhergehende Seite).

(4) Darauf achten, daß der Spannarm vollständig in die Richtung des Pfeils (A) bewegt wird.

(5) Den Zusammenhang der Positionen zwischen dem Spannarm und dem quadratischen Loch in dem Lademotorhalter kontrollieren (anfängliche Position) [Abb. 3-2 (anfängliche Position)].

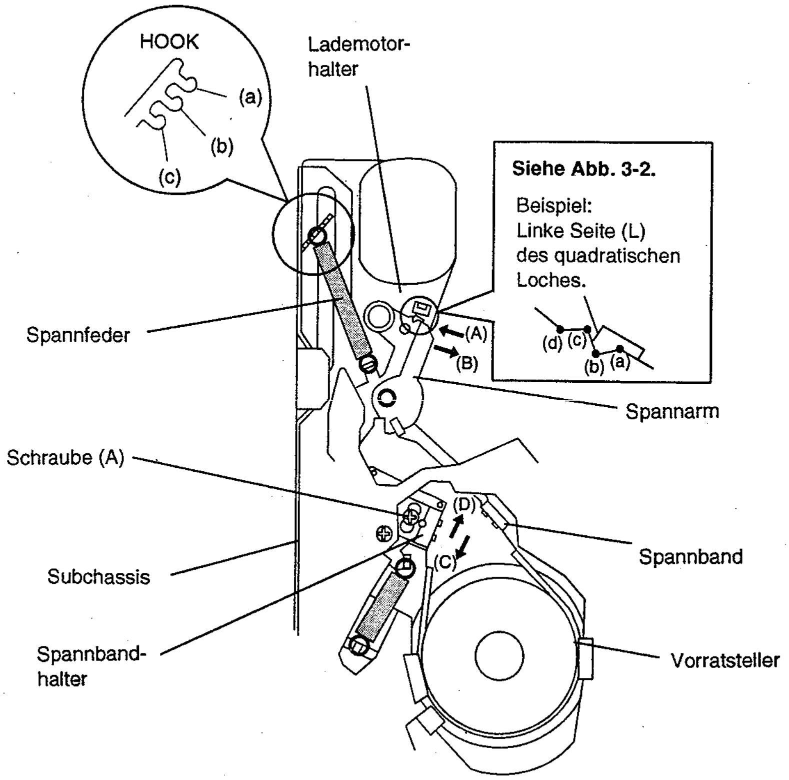


Abb. 3-1

(6) Die Position der Bandhalterung B gemäß der anfänglichen Position so einstellen, daß der Zusammenhang zwischen dem Spannarm und dem quadratischen Loch in dem Lademotorhalter der Abb. 3-2 entspricht (Einstellposition).

(7) Die Schraube (E) festziehen, um die Bandhalterung B temporär zu fixieren, so daß sie nicht bewegt wird.

[Prüfpunkt 1]

(8) Nachdem auf den Rücklaufmodus geschaltet wurde, den Video-Kamerarecorder auf den Wiedergabemodus schalten. Darauf achten, daß der Spannarm in die Richtung des Pfeiles (B) bewegt wird.

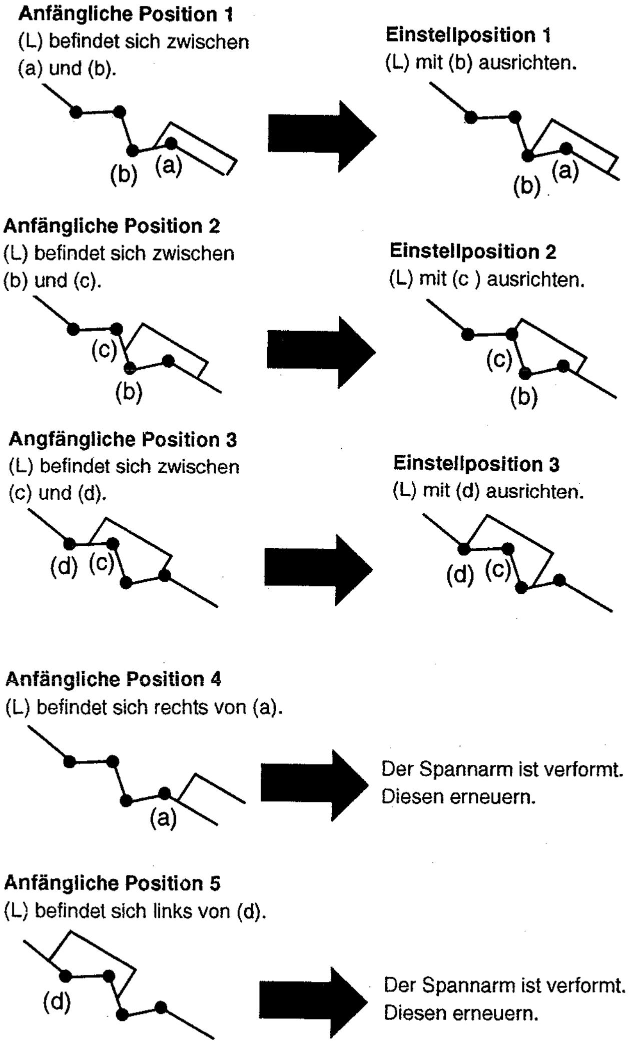
[Prüfpunkt 2]

(9) Den Cassetten-Drehmomentenmesser einsetzen, auf den Wiedergabemodus schalten und darauf achten, daß der Wert an der Vorratsseite 8 - 10 g.cm [0,00078 - 0,00098 N•m] beträgt.

(10) Falls beide Prüfpunkte erfüllt sind, den Cassetten-Drehmomentmesser entfernen und die Schraube (E) zur Beendigung der Einstellung weiter festziehen, wobei darauf geachtet werden muß, daß die Bandhalterung B nicht bewegt wird.

Hinweis:

Fall ein oder beide Prüfpunkt nicht erfüllt sind, mit der folgenden Einstellung (Gegenmaßnahme) fortsetzen.



Anfängliche Position 1
(L) befindet sich zwischen (a) und (b).

Einstellposition 1
(L) mit (b) ausrichten.

Anfängliche Position 2
(L) befindet sich zwischen (b) und (c).

Einstellposition 2
(L) mit (c) ausrichten.

Angfängliche Position 3
(L) befindet sich zwischen (c) und (d).

Einstellposition 3
(L) mit (d) ausrichten.

Anfängliche Position 4
(L) befindet sich rechts von (a).

Der Spannarm ist verformt. Diesen erneuern.

Anfängliche Position 5
(L) befindet sich links von (d).

Der Spannarm ist verformt. Diesen erneuern.

Abb. 3-2

Wenn nur Prüfpunkt 1 nicht erfüllt ist:
Eine Feineinstellung der Position der Bandhalterung B in Richtung des Pfeiles (D) ausführen. Danach die Prüfpunkte 1 und 2 nochmals überprüfen.

Wenn nur der Prüfpunkt 2 nicht erfüllt ist:
Falls das Drehmoment höher als der vorgeschriebene Wert ist, eine Feineinstellung der Position der Bandhalterung B in Richtung des Pfeiles (C) ausführen. Danach die Prüfpunkte 1 und 2 nochmals überprüfen.

Wenn beide Prüfpunkte 1 und 2 nicht erfüllt sind:
Falls das Drehmoment niedriger als der vorgeschriebene Wert ist, eine Feineinstellung der Position der Bandhalterung B in Richtung des Pfeiles (D) ausführen. Danach die Prüfpunkte 1 und 2 nochmals überprüfen.

Hinweise:

1. Falls nach den obigen Gegenmaßnahmen die Prüfpunkte 1 und 2 noch immer nicht erfüllt sind, das Spannband und die Spannarmfeder kontrollieren und das entsprechende Teil oder beide Teile erneuern.
2. Die Einhakposition der Spannarmfeder nicht verändern.

3.3 Grobeinstellung der Führungsrollen- (O) und Führungshöhen (I) (Abb. 3-3)

Hinweis:

Unbedingt diese Einstellung nach dem Austauschen der O-Führungsrolle oder der I-Führung ausführen.

■Prüfausrüstung/Vorrichtung
Spezialschraubendreher

■Einstellpunkt
Oberseite der Führung (I)
Oberseite der Führungsrolle (O)

■Vorgang

(1) Die Führungsrolle (O) oder die Führung (I) in die jeweilige Grundplatte einschrauben, bis die Fläche (A) der Führungsrolle (Führung) Kontakt mit der Oberfläche (B) der Gruindplatte aufweist, und danach die Führungsrolle (O) oder die Führung (I) um etwa 360° lösen.

Hinweis:

Nach Beendigung dieser Einstellung, unbedingt "3.4 Einstellung der Führungsrollen- (O) und Führungshöhen (I) (Einstellung nach dem Austausch der Kopftrommel)" ausführen.

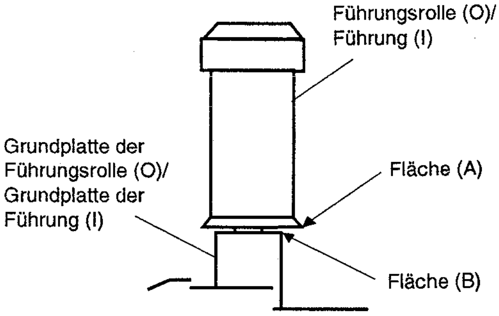


Abb. 3-3

3.4 Einstellung der Führungsrollen- (O) und Führungshöhen (I) (Einstellung nach dem Austausch der Kopftrommel) (Abb. 3-4 ~ 3-6)

Hinweise:

1. Unbedingt diese Einstellung ausführen, nachdem die Führungsrolle (O), die Führung (I) oder die Kopftrommel-Grundplatte ausgetauscht wurde. Nach dem Austauschen der Führungsrolle (O) oder der Führung (I), unbedingt die Grobeinstellung des vorhergehenden Punktes im voraus ausführen.
2. Wenn die Kopftrommel ausgetauscht wird, ist auch die Einstellung der elektrischen Schaltkreise erforderlich. Die Wartungsanleitung dieses Modells beachten und die Einstellung der elektrischen Schaltkreise ausführen.
3. Vor Beginn der Einstellung ist die ATF-R-Vorrichtung gemäß Abb. 3-6 zu modifizieren.

■Prüfausrüstung/Vorrichtung

Abgleichband
ATF-R-Vorrichtung
Oszilloskop
Spezialschraubendreher
Digital-Voltmeter

■Testpunkt

TP1 (SW30/25) auf der ATF-R-Vorrichtung
TP2 (Erdung) auf der ATF-R-Vorrichtung
TP3 (FM OUT) auf der ATF-R-Vorrichtung

■Einstellpunkt

Oberseite der Führung (I)
Oberseite der Führungsrolle (O)

■Vorgang

(1) Das vollständig zurückgespulte Abgleichband einlegen und den Video-Kamerarecorder gemäß folgendem Vorgang auf den Testmodus schalten.

[Schalten auf den Testmodus]

1) Die Stromversorgung (Netzgerät, Akku usw.) entfernen.
2) Den Stromschalter auf die Position VCR stellen.
3) Die ATF-R-Vorrichtung an die Testklemme (Teststecker) anschließen und die Stromversorgung wieder herstellen, wobei die Wiedergabetaste gedrückt gehalten werden muß.

Hinweise:

1. Falls das Bandlaufwerk arbeitet (auf den Wiedergabemodus schaltet), wenn die Stromzufuhr wieder hergestellt wird, dann bedeutet dies, daß der Video-Kamerarecorder nicht auf den Testmodus geschaltet ist. Nochmals ab Schritt 1) beginnen.
2. Der Testmodus wird freigegeben, wenn die Stromversorgung entfernt wird.

(2) Ein Oszilloskop an TP3 anschließen und die Wiedergabetaste drücken.
(3) Das Oszilloskop mit TP1 (SW30/25) synchronisieren.
(4) Die Probe des Oszilloskops auf (+) stellen.

Führung (I) (Abb. 3-4)

(5) Den Schalter SW2 auf der ATF-R-Vorrichtung gedrückt halten und die folgenden Schritte ausführen.
(6) Die Höhe der Führung (I) so einstellen, daß die Wellenform linear verläuft.
(7) Den Spannungsregler am Oszilloskop einstellen, so daß die Amplitude (a) der Wellenform auf 4 Teilungen gestellt ist.
(8) Den Schalter SW1 auf der ATF-R-Vorrichtung auf ON stellen.
(9) Den RT1 auf der ATF-R-Vorrichtung drehen und darauf achten, daß die Wellenform ändert während sie linear verläuft. Falls dies nicht bestätigt werden kann, die Feineinstellung der Führung (I) ausführen, um diese Bedingung zu erfüllen.

Führungsrolle (O) (Abb. 3-5)

(10) Den Schalter SW1 auf der ATF-R-Vorrichtung auf OFF stellen.
(11) Die Probe des Oszilloskops auf (-) einstellen.
(12) Den Spannungsregler am Oszilloskop so einstellen, daß die Amplitude (b) der Wellenform auf 4 Teilungen eingestellt ist.
(13) Den RT1 auf der ATF-R-Vorrichtung gegen den Uhrzeigersinn drehen, so daß die Spannung an Abschnitt (C) (Stift 2) der ATF-R-Vorrichtung 1,1 ±0,1 V beträgt. Dabei darauf achten, daß die Amplitude (b) der Wellenform auf 3 Teilungen eingestellt ist.
(14) Die Höhe der Führungsrolle (O) so einstellen, daß die minimale Amplitude (c) der Wellenform auf 2 ±0,3 Teilungen eingestellt ist.
(15) Nach der Einstellung der Höhen der Führung (I) und der Führungsrolle (O) ist das Abgleichband wieder einzulegen, worauf zu kontrollieren ist, daß der Inhalt dieser Einstellung erfüllt ist.

Hinweis: Nach Beendigung der Einstellung die folgenden Punkte ausführen:

1) Die ATF-R-Vorrichtung von der Testklemme (Teststecker) entfernen und die Modifikation wieder beheben.
2) Die Stromversorgung entfernen, um den Testmodus freizugeben.
3) Die Einstellpunkte in Schritt (7) und nach "3.5 Einstellung der Höhe des OHD-Arms" bestätigen.

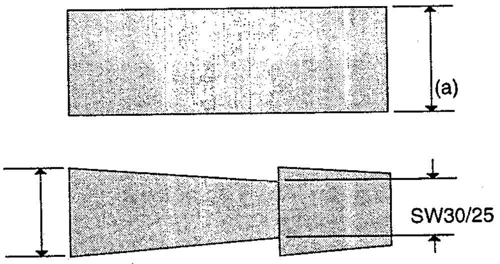


Abb. 3-4

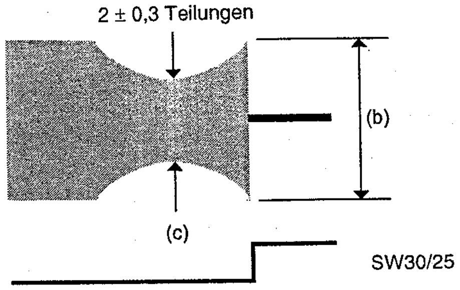
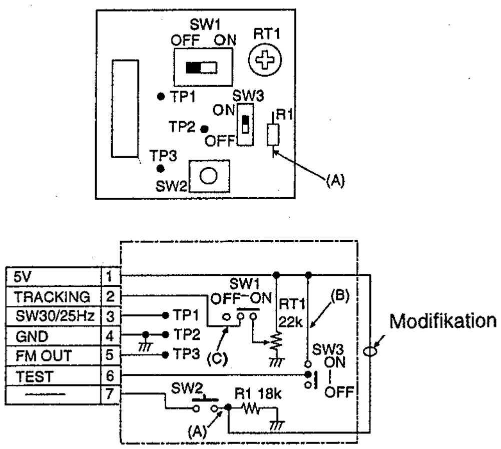


Abb. 3-5



Modifikation: Klemme (A) des Widerstandes und Stift 1 (5 V) verbinden.

Abb. 3-6

3.5 Einstellung der Höhe des OHD-Armes (Abb. 3-7)

Hinweise:

1. Unbedingt diese Einstellung nach dem Wiedereinbau des OHD-Armes ausführen.
2. Nachdem die Höhen der Führungsrolle (O)/Führung (I) eingestellt oder der Capstanmotor ausgetauscht wurden, darauf achten, daß die Einstellpunkte in Schritt (7) und danach ausgeführt werden. Falls der Inhalt nicht erfüllt wird, diese Einstellung ab Schritt (1) wiederholen.
3. Diese Einstellung minimiert geringes Verdrehen des Bandes, das zwischen dem OHD-Arm und dem Capstanmotor aufgrund der Struktur des Bandlaufwerks auftritt.
4. Die ATF-R Vorrichtung muß nicht modifiziert werden.

■Prüfeinrichtung/Vorrichtung

Abgleichband
Leerband
ATF-R Vorrichtung (SW1: OFF; SW3: OFF)
Spezialschraubendreher
Oszilloskop
Farbmonitor

■Prüfpunkt

Video-Ausgang
TP1 (SW30/25) an der ATF-R Vorrichtung
TP2 (GND) an der ATF-R Vorrichtung
TP3 (FM OUT) an der ATF-R Vorrichtung

■Status des Videorecorders

Den Farbmonitor an den Video-Ausgang anschließen.
Die ATF-R Vorrichtung an die Prüfklemme der Leiterplatte anschließen.

■Einstellpunkt

Oberseite des OHD-Armes

■Vorgang

(1) Die Stromversorgung einschalten.
(2) Ein vollständig zurückgespultes Leerband laden.
(3) Auf den Suchlauf vorwärts schalten.
(4) Das Band zwischen dem OHD-Arm und dem Capstan an einem hellen Ort genau beobachten und darauf achten, ob eine geringe Verdrehung des Bandes vorkommt. Die Farbe des Bandes (reflektiertes Bild) des verdrehten Abschnittes erscheint unterschiedlich von anderen Abschnitten. Die Verdrehung sieht auch unterschiedlich an der linken/rechten und oberen/unteren Seite aus, abhängig von dem einfallenden Licht, wie es in Abb. 3-7 dargestellt ist.
(5) Die Höhe des OHD-Arms so einstellen, daß der breiteste Abschnitt, an der die Farbe des Bandes unterschiedlich erscheint, weniger als 0,5 mm beträgt.
(6) Darauf achten, daß es am oberen oder unteren Flansch des OHD-Armes zu keiner Faltenbildung des Bandes kommt. (Wenn es jedoch zu einer geringen Faltenbildung an einem Flansch kommt, dann kann dieses im zulässigen Bereich angesehen werden, wenn keine Kratzer an dem Band verursacht werden und kein Spalt zwischen dem anderen Flansch und der Bandkante vorhanden ist.)
(7) Das wiederum zurückgespulte Leerband laden. Auf Suchlauf vorwärts und rückwärts schalten, und darauf achten, daß Schritt (6) erfüllt ist.
(8) Ein Oszilloskop an TP3 anschließen.
(9) Das Oszilloskop mit TP1 synchronisieren.
(10) Das Oszilloskop auf (+) Flankensteilheit einstellen.
(11) Das Abgleichband wiedergeben. Auf den Suchlauf vorwärts und rückwärts schalten und darauf achten, daß die FM-Wellenform nicht zusammenbricht. Auch darauf achten, daß die Rauschbalken auf dem Monitorbildschirm nicht nach oben oder unten fluktuieren.
(12) Falls Schritt (11) nicht erfüllt wird, bedeutet dies einen abnormalen (verformten) OHD-Arm. Den OHD-Arm austauschen.

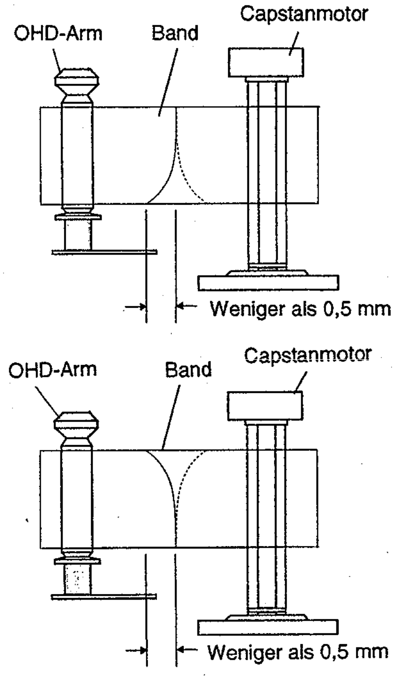


Abb. 3-7

4. Prüfung der Drehmomente

Zwei Arten von Cassetten-Drehmomentmesser stehen zur Verfügung. Verwenden Sie den geeigneten Drehmomentmesser für die jeweilige Messung.

Benennung	Videorecorder-Modus	Meßteller	Drehmoment	Verwendeter Cassetten-Drehmomentmesser
Aufwickelmoment	Wiedergabe	Aufwickelteller	10 ± 3 gcm [0,00098 ± 0,00029 N•m]	NTSC: SRK-8T-112 oder 132 PAL : SRK-8T-212 oder 232
Rückspulmoment	Suchlauf rückwärts	Vorratsteller	24 ± 6 gcm [0,00235 ± 0,00059 N•m]	NTSC: SRK-8T-132 PAL : SRK-8T-232
Aufwickelteller-Bremsmoment	Suchlauf rückwärts auf Stopp	Aufwickelteller	10 gcm oder mehr [0,00098 N•m oder mehr]	NTSC: SRK-8T-112 oder 132 PAL : SRK-8T-212 oder 232
Bandspannmoment	Entladen	Vorratsteller	25 - 50 gcm [0,00245 - 0,0049 N•m]	NTSC: SRK-8T-132 PAL : SRK-8T-232

Drehmomentwerte

Die Drehmomentwerte werden in dieser Anleitung in konventionellen Einheiten gemeinsam mit den in Klammern [ ] gestellten SI-Einheiten angegeben.

Hinweis: SI steht für "Le Système international d'unités" in Französisch, womit ein international normiertes System der Maßeinheiten bezeichnet wird.